



Dairy Whiteners

Are there lumps in your tea (or throat)?

Dried milk with added sugars is what dairy whitener is all about. It can be readily used for making tea or coffee, with or without additional sugar. Easy, quick and convenient, right? Little wonder, then, that there is an increase in the use of dairy whiteners (also known as sweetened milk powders) in tea and coffee as well as the manufacturing of foods like soups, sauces, puddings and cereal dishes. The attributes of a good dairy whitener can be enumerated easily enough, the whitening ability and emulsion stability being particularly important. This report presents our findings on six brands of dairy whiteners on various quality, safety and acceptability parameters.

A Consumer Voice Report

As per our standard procedure, we undertook market research to identify the regular-selling brands of dairy whiteners across the country. We tested six brands on various quality, safety and acceptability parameters.

The key parameters for which the samples were tested included protein, moisture, acid-insoluble ash, total ash, added sugar, insolubility index and fat. We also carried out sensory tests as well as tests to check for microbiological safety. The testing was conducted at an NABL-accredited laboratory.

The samples were tested as per specifications laid out by Indian Standard IS: 12299-1998, FSS Regulations 2011 (microbiological and heavy metals), and Legal Metrology (Packaged Commodities) Rules, 2011.

On 2 August 2017, FSSAI issued a directive for operationalisation of amended regulations regarding revised standards for milk and milk products (including dairy whitener). However, for the present *Consumer Voice* report on dairy whiteners, the amended regulations are not applicable since all the samples we purchased were manufactured before 2 August 2017.

Dairy whitener is prepared by spray drying of cow/buffalo milk or a mixture thereof. The liquid is removed from the milk and a certain quantity of sugar is added so that it can be readily used for tea or coffee making. Normally dairy whiteners contain around 20 per cent added sugars.

Milk Powder and How It Is Different from Dairy Whitener

Milk powder, also known as dried milk, is made by evaporating milk to dryness. Preserving the milk is one of the main purposes of dry milk; milk powder has a far longer shelf life than milk in liquid form and does not need to be refrigerated because of its low moisture content. Another purpose is to reduce its bulk for economy of transportation. Powdered milk and dairy products include such items as dry whole milk, non-fat (skimmed) dry milk, dry buttermilk, dry whey products and dry dairy blends.

Milk powder and dairy whitener are not one and the same thing for the following reasons:

- Dairy whitener has more sugar compared to milk powder.
- Milk powder can be lumpy when mixed with liquids; dairy whitener dissolves smoothly and easier than milk powder.
- Dairy whiteners have a longer shelf life than milk powder.
- Dairy whiteners usually have less nutrients and protein than full-cream milk powder.

BRANDS TESTED

| Rank | Total Score out of 100 (rounded off) | Brand | Product Claim | MRP (Rs) | Net weight (gm) | Price per 100 gm, Rs | Best before | Manufactured/Marketed by |
|------|--------------------------------------|--------------|------------------------------------|------------------|-----------------|----------------------|-------------|--|
| 1 | 83 | Nestle | Dairy whitener (proprietary food*) | 92 | 200 | 46 | 9 months | Nestle India Ltd |
| 1 | 83 | Nova | Dairy whitener (proprietary food*) | 205 | 500 | 41 | months | Sterling Agro Industries Ltd |
| 2 | 82 | Mother Dairy | Dairy whitener (proprietary food*) | 200 | 500 | 40 | 9 months | Mother Dairy Fruit & Vegetable Pvt. Ltd |
| 2 | 82 | Gowardhan | Dairy whitener (proprietary food*) | 165 | 500 | 33 | 12 months | Parag Milk Foods Ltd |
| 3 | 79 | Patanjali | Dairy whitener | 65 | 200 | 32.5 | 9 months | Patanjali Ayurved Ltd |
| 4 | 78 | Amulya | Dairy whitener, ISI marked | 199 (Rs. 15 off) | 500 | 39.8 | 12 months | Gujarat Co-operative Milk Marketing Federation Ltd |

Score Rating: >90: very good*****, 71–90: good****, 51–70: fair***, 31–50: poor**, up to 30: very poor*

*Proprietary food refers to food that has not been standardised under any regulations and has no definite formulation.

Comparative Test



CV RECOMMENDATIONS | TOP PERFORMERS

Nestlé | Nova

VALUE FOR MONEY

Gowardhan

Key Findings

- Based on the overall test findings, the top performers are Nestlé and Nova.
- The value-for-money brand is Gowardhan.
- Protein was found highest in Nova.
- Mother Dairy was the most liked brand in the sensory tests.
- All brands are microbiologically safe for consumption.
- Amulya, an ISI-marked product, did not meet the requirement of Indian Standard since milk solids-not-fat (MSNF) was lower and added sugar was higher than the specified limits.
- Four out of the six brands claimed to be 'proprietary food'. Mother Dairy, Nova and Gowardhan mentioned 'dairy whitener' on one side and 'proprietary food' on the opposite side of packaging, which may cause confusion in the minds of consumers. The word 'proprietary food' should appear clearly along with 'dairy whitener'.

TEST RESULTS FOR PHYSICO-CHEMICAL PARAMETERS

Protein | Moisture | Acid-Insoluble Ash | Insolubility Index | Total Ash | Fat | Added Sugar | Titratable Acidity as Lactic Acid

◆ Protein

Protein is an essential nutrient and inherently found in milk and milk products. It plays an important role in cellular maintenance, growth and functioning of the human body.

At present, no requirement is prescribed in the Indian Standard for protein in dairy whiteners.

- Protein was highest in Nova (22.86 per cent) and lowest in Patanjali (19.75 per cent).

◆ Moisture

Moisture is an important factor in food quality, preservation, and resistance to deterioration. Moisture in inappropriate amounts is damaging to the useful life of food. The presence of moisture is inherent in the processing of food and to some extent is good for maintaining its taste and odour but excess of moisture is undesirable. As per Indian Standard, moisture in dairy whitener shall not be more than 4 per cent.

- Moisture content in all the brands was within the specified limit.
- Moisture content was lowest in Gowardhan (1.90 per cent) and highest in Amulya (2.80 per cent).





◆ Acid-Insoluble Ash

Acid-insoluble ash indicates the presence of sand, dirt and dust. As per Indian Standard, it should not be more than 0.10 per cent.

- All brands were within the specified limit.
- Acid-insoluble ash was lowest in Gowardhan.

◆ Insolubility Index

The extent to which milk powders are insoluble in water has traditionally been measured using an insolubility test (solubility index). It shall be a maximum 1.5 ml.

- All the brands were found to be well within the specified limit.

◆ Total Ash

As per Indian Standard, total ash shall not be more than 5.5 per cent (on dry-weight basis).

- Total ash in all brands was within the maximum permissible limit. It was lowest in Nestle (4.62 per cent) and highest in Nova (5.37 per cent).

What Does Ash in Food Mean?

Ash refers to the inorganic material, such as minerals, present in food. It is the portion of the food or any organic material that remains after it is burned at very high temperatures. The quality of many foods depends on the concentration and type of minerals they contain, including their taste, appearance, texture and stability.

◆ Fat

Fat is an essential part of any balanced diet, providing essential fatty acids and helping the body absorb fat-soluble vitamins (vitamins A, D, E, and K). It shall not be less than 20 per cent as per Indian Standard.

- All the brands met the minimum requirement specified by Indian Standard.

Comparative Test

Milk Solids-not-Fat

Milk has mainly two constituents: fat and solids-not-fat (SNF). Solids such as vitamins, minerals, protein and lactose together make up SNF. SNF is the most essential part of the milk. As per Indian Standard, it should be a minimum 57 per cent in dairy whiteners.

MSNF percentage in Amulya was found to be less than the minimum limit specified by Indian Standard.

◆ Total Added Sugar (as sucrose)

Added sugars are sugars and syrups put in foods during preparation or processing. This does not include naturally occurring sugar such as those in

milk. For optimal health, we should restrict our added-sugar intake. As per Indian Standard, total added sugar as sucrose shall be a maximum 18 per cent.

- Added sugar was highest in Mother Dairy and lowest in Gowardhan.
- Added sugar in Amulya was found to be beyond the maximum limit.

◆ Titratable Acidity as Lactic Acid

Titrate acidity is a measure of the amount of acid present in a solution. Expressed as grams/litre, it should be on the lower side.

- Titratable acidity was on the lower side in all brands.
- It was lowest in Mother Dairy and Nestle.

PHYSICOCHEMICAL SCORES

| Parameters ↓ | Weightage (%) | Nestle | Nova | Mother Dairy | Gowardhan | Patanjali | Amulya |
|--------------------------------|---------------|------------------|------------------|------------------|------------------|----------------|----------------|
| | | Proprietary food | Proprietary food | Proprietary food | Proprietary food | Dairy whitener | Dairy whitener |
| Protein | 10 | 7.60 | 8.93 | 8.30 | 7.98 | 7.38 | 8.47 |
| Moisture | 8 | 7.20 | 7.25 | 6.93 | 7.28 | 6.80 | 6.56 |
| Acid-insoluble ash | 8 | 6.36 | 5.96 | 5.12 | 7.04 | 6.64 | 5.52 |
| Insolubility index | 6 | 5.40 | 5.40 | 5.40 | 5.40 | 5.40 | 5.40 |
| Total ash | 6 | 4.62 | 3.82 | 3.84 | 4.50 | 3.71 | 3.66 |
| Fat | 6 | 4.26 | 4.39 | 4.30 | 4.38 | 4.32 | 4.3 |
| Added sugar | 6 | 2.13 | 2.20 | 2.02 | 2.80 | 2.38 | 2.57 |
| Titrate acidity as lactic acid | 6 | 5.83 | 5.23 | 5.98 | 4.51 | 5.10 | 4.37 |

FOR MICROBIOLOGICAL ACTIVITY

Microbiological contamination is a very serious issue for all food products. We conducted this test for coliform count, total plate count and yeast and mould count, as also for presence of *E. coli*, *S. aureus*, and *Salmonella*. 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.

Coliform bacteria, *E. coli* and *S. aureus* shall be absent in 0.1 gm of the dairy whitener, while *Salmonella* is required to be absent in 25 gm. The colony count per gram of the product shall not be more than 40,000. Yeast and mould count shall be 50 cfu/gm.

- All the brands were within the specified limit for the aforementioned microbiological parameters.
- Yeast and mould count was less than 10 cfu/gm.

FOR SENSORY ATTRIBUTES

Sensory tests were conducted to judge the products on these attributes: colour and appearance, flavour, taste and after-taste feeling, overall acceptability, and whether free from lump and extraneous matter. These tests were conducted under the supervision of trained experts.

- *Mother Dairy scored highest in the tests.*

| Brand | Score out of 22 |
|--------------|-----------------|
| Mother Dairy | 18.28 |
| Nestle | 17.99 |
| Nova | 17.84 |
| Gowardhan | 16.37 |
| Patanjali | 15.93 |
| Amulya | 15.57 |

FOR GENERAL QUALITIES

◆ **Marking/Labelling**

The following details shall be marked on the product label:

- Name of product and brand name, if any
- Name and address of manufacturer
- Month and year of manufacturing or packing
- Directions for storage

- Net weight
- 'Best before' for consumption
- Batch or code number
- Green dot to denote vegetarian status
- MRP
- FSSAI license number
- Customer-care details

- *All the brands had the required information. Gowardhan did not mention storage instructions.*

◆ **Packing**

Packing plays an important role in maintaining consistent quality of the product, preventing its deterioration, and increasing the shelf life.

- *All the brands had suitable food-grade packaging.*
- *Nova was in a tin container; Nestle, Mother Dairy and Patanjali were in poly packs; Gowardhan was in a plastic box; and Amulya was in a hard paper box.*

◆ **Net Weight**

Samples from all brands were verified for net weight as per the quantity claimed. The net weight should be within the tolerance limit permitted in Legal Metrology Rules.

- *The net weight of all brands was found to be above the declared quantity.*



Comparative Test

| Parameters ↓ | Weightage (%) | Nestle | Nova | Mother Dairy | Gowardhan | Patanjali | Amulya |
|--------------|---------------|------------------|------------------|------------------|------------------|----------------|----------------|
| | | Proprietary food | Proprietary food | Proprietary food | Proprietary food | Dairy whitener | Dairy whitener |
| Marking | 4 | 4 | 4 | 4 | 3.7 | 4 | 4 |
| Packing | 3 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| Net weight | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

Manufacturers' Comments

As a matter of policy, before publication, the test results of the brands are shared with their respective manufacturers/marketers inviting their views/comments. For this study on dairy whiteners, most of the manufacturers sent in their comments and these were responded to accordingly. We reproduce here the comments of Amul as well as our reply:



| Brand | Manufacturer's Comment | | | | | | | | | | | | | | | | | | | | |
|--|---|---------------------------------------|---------------------------------------|--------------------------------------|---------------------|---------------------|-----|--------|--------|-----|-------|-------------|--------|--------|------|--------|---------|--------|--------|-----|--------|
| Amul – Gujarat Cooperative Milk Marketing Federation Ltd | 1) The results for added sugar, fat and proteins are not near the specifications and values we maintain. | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>Parameter</th> <th>1st analysis results (Consumer Voice)</th> <th>Re-analysis results (Consumer Voice)</th> <th>Variation</th> <th>Amul's test results</th> </tr> </thead> <tbody> <tr> <td>Fat</td> <td>18.30%</td> <td>20.31%</td> <td>11%</td> <td>20.5%</td> </tr> <tr> <td>Added sugar</td> <td>23.15%</td> <td>21.43%</td> <td>7.4%</td> <td>17.94%</td> </tr> <tr> <td>Protein</td> <td>24.39%</td> <td>21.94%</td> <td>10%</td> <td>20.52%</td> </tr> </tbody> </table> | Parameter | 1st analysis results (Consumer Voice) | Re-analysis results (Consumer Voice) | Variation | Amul's test results | Fat | 18.30% | 20.31% | 11% | 20.5% | Added sugar | 23.15% | 21.43% | 7.4% | 17.94% | Protein | 24.39% | 21.94% | 10% | 20.52% |
| | Parameter | 1st analysis results (Consumer Voice) | Re-analysis results (Consumer Voice) | Variation | Amul's test results | | | | | | | | | | | | | | | | |
| | Fat | 18.30% | 20.31% | 11% | 20.5% | | | | | | | | | | | | | | | | |
| Added sugar | 23.15% | 21.43% | 7.4% | 17.94% | | | | | | | | | | | | | | | | | |
| Protein | 24.39% | 21.94% | 10% | 20.52% | | | | | | | | | | | | | | | | | |
| 2) You have not provided the details of the method followed for sensory evaluation. On the basis of the results shared, we conclude that the standard method was not followed. The results are subjective and lack scientific justification. | | | | | | | | | | | | | | | | | | | | | |
| 3) Please do not publish the results for Amulya Dairy Whitener in your report. Please do not consider Amul brand products for further analysis. | | | | | | | | | | | | | | | | | | | | | |

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 editorial@consumer-voice.org



Consumer Voice

- 1) The tests were conducted in a reputed NABL-accredited laboratory, which is also recognized by FSSAI and BIS. The testing was carried out as per Indian Standard IS: 12299 and standard test methods were followed by the lab. The lab has confirmed that the reported test results are in order as per specified protocol.
We got the retesting done at the same laboratory as per the standard test procedure specified in IS: 12299. The retest results were communicated to Amul.
The lab regularly carries out testing of food products including milk and milk products. A lab recognised by NABL and regulatory bodies FSSAI and BIS cannot be questioned on repeat test results.
- 2) We had shared our test programme along with parameters and methodology (including for sensory tests) before carrying out the tests, vide our letter dated 23 August 2017. To judge the acceptability of a product by consumers, sensory panel tests were conducted in accordance with the guidelines for food products. The panellists gave their scores based on their judgements. The average scores obtained were shared with all concerned brands.
- 3) Independent comparative testing for consumer awareness is conducted keeping in mind the government's guidelines for voluntary consumer organisations (VCOs) specifying that the opportunity to respond on test findings, before publishing, should be given to all manufacturers whose products are covered. Further, as per IS/ISO/IEC Guide 46 (comparative testing of consumer products and related services – general principles), the methods used to obtain the samples for testing should preferably be the same as those used by consumers at normal retail outlets. So, Consumer Voice on its own can collect samples of a particular brand when the same is available in retail outlets.