



Five Brands of 20-Litre Packaged Drinking Water

Bisleri, Kinley and Pure Drop not safe enough

Whether in one-litre bottles or 20-litre bubble-topped cans, packaged drinking water has become a common sight—and a much-in-demand product. Without getting into the debate and irony of water as a commercial product, we at *Consumer Voice* decided that it was high time consumers knew about the safety and acceptability parameters relevant to this ‘precious commodity’ (an oxymoron, if you will). Following up on our report on one-litre packaged drinking water (covering 12 brands, published in the May issue), we present here our findings on five brands of the 20-litre variant. The questions and parameters remain the same, hinging on whether the water we procure at a price is drinkable enough. It certainly is not as simple as checking if the water looks clean and clear. Harmful, microscopic organisms are not visible to the naked eye. If they were, we would not be consuming the brands that we did, despite their not fulfilling basic safety conditions (as our tests show). The following report will turn out to be an eye-opener in more ways than one, because it will throw up names that are not recommended for consumption—mind you, some of these have been household names for a while now. Read on to find out if your packaged water brand is one of them.

A Consumer Voice Report

Like the one-litre variants, 20-litre packaged drinking water is also covered under mandatory ISI marking scheme. For the tests, carried out at an NABL-accredited laboratory, we referred to IS: 14543: 2004 with the latest amendments. Test parameters were mainly based on Indian Standard in order to judge the overall quality of the drinking water being sold, as also on the requirements of FSS Regulations, 2011,

which cover the product requirements.

For the tests, we chose four regular/top-selling brands and one local brand (Delhi-based) of 20-litre packaged drinking water. These were evaluated on quality, acceptability and sensory parameters. The key parameters included presence of undesirable substances and microbiological organisms, pesticide residues, toxic/heavy metals, total dissolved solids (TDS), pH level, radioactivity, turbidity and colour.

As per Gazette Notification dated 15 November 2015, issued by the ministry of health and family welfare, FSS Amended Regulation 2016 (as per revised version of IS 14543: 2016) has come into force from 1 March 2017. For the latest *Consumer Voice* report on packaged drinking water, since the samples of water were drawn from the market before 1 March 2017, the test programme was carried out on the basis of IS: 14543: 2004.

The dual problem of not having access to water or having access to unsafe water has resulted in a situation where safe and hygienic water, a basic amenity, is becoming a luxury. The Asian Development Bank (ADB) has forecast that by 2030 India will have a water deficit of 50 per cent. The union ministry of water resources has estimated the country's current water requirements to be around 1,100 billion cubic metres per year, which is forecasted to be around 1,200 billion cubic metres for the year 2025 and 1,447 billion cubic metres for the year 2050.

BRANDS TESTED

Rank	Total Score out of 100 (Rounded off)	Brand	MRP (Rs)	Net Quantity (Litres)	Best before (Months)	Manufactured/Marketed by
1	98	DJB Jal	52	20	90 days	Delhi Jal Board, New Delhi
2	92	Aquafina	90	20	2 months	Beltek Canadian Water Ltd, Noida, Uttar Pradesh
Downgraded to poor as they do not comply with microbiological requirements		Bisleri	70	20	1 month	Bisleri International Pvt. Ltd, New Delhi
		Kinley	95	20	3 months	Moon Beverages Ltd, Greater Noida, Uttar Pradesh
		Pure Drop	40	20	30 days	Perfect Beverages Pvt. Ltd, New Delhi

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



Comparative Test

CV RECOMMENDATION | TOP PERFORMER | VALUE FOR MONEY

DJB Jal

BRANDS TO AVOID

Bisleri | Kinley | Pure Drop

These brands did not meet safe microbiological parameters and are therefore considered unsafe for drinking.



Key Findings

- Based on the overall test findings, DJB Jal is the top performer. Next in ranking is Aquafina.
- DJB Jal is also the value-for-money brand.
- Bisleri, Kinley and Pure Drop did not meet the microbiological requirements specified by Indian Standard and are therefore not recommended for consumption. Total viable colony count (of bacteria) was found to be high in all three brands.
- *Pseudomonas aeruginosa* was detected in Pure Drop. This brand was also found to contain yeast and mould.
- None of the brands was found surpassing the maximum permissible limit for various minerals, toxic substances and residual pesticides.
- In physical tests (colour, TDS, turbidity, pH), all brands met the requirement set by Indian Standard.

TEST RESULTS

FOR MICROBIOLOGICAL ACTIVITY

Microbiological contamination of water has long been a matter of concern to the public. Many infectious microorganisms found in the environment – such as shigella, *E. coli*, vibrio, salmonella, coliform, *S. aureus*, faecal streptococci, yeast and mould, *V. cholerae*, *V. parahaemolyticus*, *Pseudomonas aeruginosa* – can contaminate the water supplied to us. These microorganisms can cause symptoms such as nausea, vomiting, diarrhoea and stomach cramps. In healthy adults, these illnesses are usually mild and do not last long. In infants, children, the elderly, and persons with weakened immune systems, these illnesses can be more severe.

We conducted tests for microbiological contamination as per the requirements set out by

Indian Standard, are reproduced here.

- Bisleri, Kinley and Pure Drop failed to meet the microbiological requirements – hence they are not safe for consumption. Total viable colony count was found to be high in all three brands.
- *Pseudomonas aeruginosa* was detected in Pure Drop. This brand was also found to contain yeast and mould.





FOR PHYSICOCHEMICAL PARAMETERS

Undesirable Substances | Toxic/Heavy Metals | Pesticide Residues | TDS | pH | Turbidity | Colour

◆ Undesirable Substances

Apart from the toxic metals and substances, there are a few undesirable substances that can make drinking water unhealthy/unhygienic or hamper its taste. All these undesirable substances were tested as per the requirements of IS, and a handful of brands contained some of these in negligible quantities.

- All brands were found to be within the limits set by Indian Standard for these substances: aluminium, anionic surface-active agents, antimony, barium, borates, copper, iron, manganese, mineral oil, nitrite, phenolic compounds, residual chlorine, selenium and sulphide.

Nitrate is a colourless, odourless and tasteless compound that is present in some groundwater. High nitrate levels in water can cause methemoglobinemia or blue baby syndrome, a condition found especially in infants less than six months old. The stomach acid of an infant is not as strong as in older children and adults. This causes an increase in bacteria that can readily convert nitrate into nitrite (NO₂).

- **Nitrate (as NO₃):** Nitrate in drinking water can be a maximum of 45 mg/litre. *All five brands*

contained some amount of nitrate, but it was well within the maximum permissible limit.

- **Fluoride (as F):** As per the national standard, the maximum amount of fluoride permissible in packaged drinking water is 1 mg/litre. All brands were found to be within the permissible limit.

Children aged eight years and younger exposed to excessive amounts of fluoride have an increased chance of developing pits in the tooth enamel, along with a range of cosmetic effects on teeth.

- **Silver (as Ag):** Levels of silver up to 0.1 mg/litre can be tolerated without risk to health. Silver was not detected in any of the tested brands.
- **Chloride (as Cl):** The maximum permissible limit for chloride is 200 mg/litre. Chloride was well below the maximum permissible limit in all tested brands.

Chloride in drinking water is generally not harmful to people until high concentrations are reached, although chloride may be injurious to some people suffering from diseases of the heart or kidneys. Restrictions on chloride concentrations in drinking water are generally based on taste requirements rather than on health. Liquid chlorine is mixed into drinking water to destroy bacteria.

Comparative Test

- **Sulphate (as SO₄):** The permissible limit for sulphate is 200 mg/litre. It was not detected in Aquafina, while in the others it was well below the maximum permissible limit.

Sulphate is a naturally occurring substance that contains sulphur and oxygen. Sulphate is generally considered to be non-toxic. However, the consumption of drinking water containing high amounts of sulphate may result in intestinal discomfort, diarrhoea and consequently dehydration.

- **Alkalinity (as HCO₃):** Alkalinity is not considered to be detrimental to humans, but is generally associated with hardness, high pH values and excessive dissolved solids, all of which may be undesirable. HCO₃ should not exceed 200 mg per litre. All the brands were found well below the permissible limit for alkalinity
- **Calcium (as Ca) and Magnesium (as Mg):** Calcium in water and certain other minerals in water are healthy. Calcium-rich water has a higher pH and that is better than drinking acidic water. However, calcium and magnesium are

components of permanent hardness, and thus are undesirable in drinking water. The amount of calcium should not exceed 75 mg per litre, while magnesium should not be more than 30 mg per litre. In the tests, all brands were found to contain very slight amounts of calcium and magnesium

Sodium (as Na): Sodium is an essential mineral in our diet. It is commonly found in the form of sodium chloride (salt). Salt has no smell and it dissolves easily in water and gives water a salty taste at high levels. The amount of sodium should not exceed 200 mg per litre. All the brands were found well within the maximum permissible limit for sodium.

◆ Toxic/Heavy Metals

As per the national standard, the toxic substances that should not be present in drinking water are mercury, cadmium, arsenic, cyanide, lead, chromium and nickel.

- All the brands were tested for the presence of toxic substances and heavy metals. These were detected in a marginal amount in DJB water but were well below the permissible limit. The rest of the brands were clear.





◆ Pesticide Residues

Pesticide is a chemical or biological agent (such as a virus, bacterium, antimicrobial, or disinfectant) that deters, incapacitates, kills, or otherwise discourages pests. Pesticides may cause acute and delayed health effects in people who are exposed. Such adverse health effects range from simple irritation of the skin and eyes to more severe effects like affecting the nervous system, mimicking hormones causing reproductive problems, and causing cancer.

As per Indian Standard, the maximum permissible limit is 0.0001 mg/litre for individual pesticide and 0.0005 mg/litre for total pesticide residues.

All tested brands were within the requirement set by the national standard. Traces of 2,4-dichlorophenoxyacetic acid were found in Aquafina but these were well below the specified limit.

◆ Total Dissolved Solids (TDS)

Total dissolved solids are the amount of minerals, salts or metals dissolved in a given volume of water. TDS is directly related to the purity of potable water and the quality of water purification systems, and affects everything that consumes, lives in, or uses water, whether organic or inorganic. The standard/regular practice of packaged drinking water in

Radioactivity

Radioactive minerals occur irregularly in the bedrock, similar to other minerals such as iron and arsenic. Radioactive alpha and beta emitters dissolve easily in water. The principal health concerns associated with regulated radionuclides in water include: radon gas increases the risk of lung cancer; uranium increases toxicity risk to the kidneys; and radium increases one's risk of bone cancer.

No radioactive emitters were found in any of the tested brands.

Comparative Test



industry is to take the potable water from a regular source and demineralise the water through the RO system and in the required quantity to balance the TDS level as permitted in the national standard.

As per Indian Standard, total dissolved solids in packaged drinking water shall be a maximum 500 mg/litre.

- TDS in all brands was lower than the maximum permissible limit.
- Highest TDS was observed in Bisleri (98 mg/litre), followed by DJB Jal (95 mg/litre) . TDS was lowest in Kinley (27 mg/litre).

Water is a good solvent and picks up impurities easily. As per WHO guidelines for drinking water quality, water with extremely low concentrations of TDS may be unacceptable to consumers because of its flat, insipid taste. At the same time, drinking water becomes significantly and increasingly unpalatable at TDS levels greater than about 1,000 mg/litre.

◆ pH

The pH level of your drinking water reflects how acidic it is. pH stands for 'potential

hydrogen', referring to the amount of hydrogen mixed with the water. pH is measured on a scale that runs from 0 to 14. A measurement of seven is neutral, indicating there is no acid or alkalinity. A measurement below 7 indicates presence of acid and a measurement above 7 indicates alkalinity. The normal range for pH in packaged drinking water as per Indian Standard is between 6.5 and 8.5.

All the brands of packaged drinking water were within the specified range for pH.

◆ Turbidity

Turbidity is a principal physical characteristic of water. It is caused by suspended matter or impurities that interfere with the clarity of the water. These impurities may include clay, silt, finely divided inorganic and organic matter, and soluble coloured organic compounds.

Turbidity in water shall not be more than 2 nephelometric turbidity units (NTU).

- Turbidity was less than the maximum permissible limit in any of the brands.

Colour (in hazen unit) was not detected in any of the brands.

PHYSICOCHEMICAL SCORES

Parameters ↓	Weightage (%)	DJB Jal	Aquafina	Bisleri	Kinley	Pure Drop
Undesirable substances	20	19.07	19.8	18.86	19.75	19.21
Toxic/Heavy metals	12	12	12	12	12	12
Pesticide residues	10	10	9.0	10	10	10
TDS	10	9.70	5.92	9.88	5.62	8.56
pH	7	7.0	4.48	4.48	5.32	4.20
Turbidity	3	2.4	3	3	3	3
Colour	1	1	1	1	1	1
Sub-total	63	61.17	55.2	59.22	56.69	57.97

FOR SENSORY ATTRIBUTES

The sensory test was conducted in a reputed lab by qualified and experienced members.

- Bisleri, Kinley and Pure Drop were not included in the sensory test for taste as they had failed the microbiological test and could be unsafe to drink.

The remaining two brands scored equally well on odour and taste parameters.

FOR GENERAL QUALITIES

◆ Marking/Labelling

The bottle of packaged drinking water should be legibly marked with these details: a) name of the product; b) name and address of processor; c) brand name, if any; d) batch or code number; e) date of processing/packaging; f) treatment of disinfection, if any; g) 'best before' date; and h) mandatory ISI mark, MRP, net quantity and customer care details. The green dot (indicating vegetarian status) is not a mandatory requirement for packaged drinking water.

- All brands except Pure Drop were found to meet the marking/labelling requirements and hence were given full scores. Date of packaging was not marked in Pure Drop.

All brands carried the ISI mark, which is a mandatory requirement.

◆ Packing

The packaging material should be of food-grade and the cap of the bottle must not have any colour migration on the product.

- All the brands were packaged in reusable, sealed 20-litre colourless jars.

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. We reproduce here the comments of manufacturers as well as our reply:



Comparative Test

Brand	Manufacturer's Comment	Consumer Voice
Kinley	<p>Coca-Cola India has an uncompromising commitment to product safety and quality. The Coca-Cola Company and its authorised bottlers exercise strict quality and safety measures specifically designed to prevent any product-quality deviations. All our products and brands are built on consumer trust and Kinley remains the nation's favourite packaged water. It is safe and hygienic.</p> <p>With respect to the said batch of product, we have tested it through an external accredited source as well as our laboratories, which test the products as per Bureau of Indian Standards (BIS). The parameters of the samples are well within the prescribed limit and standards. External lab-water analysis reports are publically available and are uploaded on Food Safety and Standards Authority of India's (FSSAI) website, under 'Project Clean Drinking Water'. We would request VOICE Society to re-verify the result of the earlier tests.</p>	<p>The tests were conducted in a reputed NABL-accredited laboratory. It has confirmed that the reported test results are in order as per specified protocol.</p>
Bisleri	<p>Bisleri International Pvt. Ltd has sent a letter attaching their in-house test report of 20-litre jars control sample. The same has passed all the test parameters</p>	<p>Our lab has confirmed that reported results are in order as per specified protocol.</p>

Safe Handling Matters

Do you know that it's good practice to ensure that the opening of your 20-litre bottle is cleaned/sanitised before it is mounted on your water dispenser?

In Indonesia, where the bottled water market is almost twice that in India, most brands provide free wet-wipe sachets to enable cleaning and disinfecting of the bottles before they are placed on a water dispenser.

This practice is totally missing in India and is a cause for worry owing to dirty handling and storage conditions in the trade. Brands big and small can, and ought to, take minimal steps to incorporate clean handling at their end and also educate and facilitate the same at the consumers' end.

As consumers, we need to make sure that the bottle opening is suitably sanitised. Supervise your household staff if they are responsible for switching out the water bottles in your dispenser. They may not understand the importance of thoroughly wiping the top of the bottle and may need some explanation and demonstration on how to correctly wipe and replace the bottle.

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