



Pass the ketchup, please

Most refrigerators in India have a bottle of ketchup in them. Yes, we Indians like to put ketchup on everything – fried pakoras or samosas, kadai-tossed vegetables, a plate of noodles, a sandwich, namkeen mixtures and packed chips, an omelette or kebabs... And with quick fast foods like pizzas, burgers and hotdogs, it is a must-have. Ketchup for most Indians goes with just about everything. So, what's the story?

At VOICE, we planned to find out if all brands stocked in our refrigerators are safe for consumption. Are they all following the set standards and how do they perform against each other in terms of quality? If they all are worth buying, they still have to make it through our stringent quality tests. Like we always do, we bought the best-selling ketchup brands – in this case, 12 – from well known malls and major retail shops and directly sent these to an NABL-accredited laboratory.

The good news is, unlike in the case of the paneer brands that we tested last month, where all brands except one failed crucial microbiological tests, all brands of ketchup passed all the tests. No ketchup

brand among the tested dozen had any discrepancy as far as the set standards go. However, a few scored better compared to others on various parameters discussed in detail below.



Comparative Test 1

BRANDS TESTED		
Rank	Brand name	Manufactured/ Marketed by
1	Heinz	Heinz India
2	Maggi	Nestle India
3	Cremica	Mrs. Bector's Food Specialities
3	Kissan	Hindustan Lever
4	Reliance Select	Reliance Fresh
5	Del Monte	Field Fresh Foods.
6	Tops	GD Foods
7	Safal	Mother Dairy Fruits & Vegetables
8	Tasty Treat	Food Bazaar (a division of Pantaloon Retail)
8	Smith & Jones	Capital Foods
9	Pan	Pan Foods
10	Mum's	Amarpali Biotech India

Value for Money

Reliance Select

Rs 75 for 1 kilogram

- It costs Rs 60 less than top brand Heinz, with only 3 points less in overall scores.
- The brand misses the third spot – shared by Cremica and Kissan – by a mere one point and costs Rs 40 less than Cremica and Rs 45 less than Kissan.
- In sensory tests, it performs better than Heinz and Cremica.

Best in Flavour and After-Taste

Kissan

- One of the oldest players in the Indian market, Kissan impressed the experts' panel for sensory tests and scored the highest points.
- In overall results, it shares No. 3 position with Cremica.
- Contains considerable lycopene content.

CV Recommendation | Best Buy

Heinz

- Has the highest quantity of lycopene, a naturally occurring pigment with beneficial health effects.
- Contains no preservatives.
- Gets top score for low sugar percentage.
- Only brand to come in a convenient-to-use, non-breakable pet bottle.
- Was adjudged Best Buy in 2007 as well.

Good Picks

Maggi | Cremica | Kissan

- Maggi at overall No. 2 scores second highest points for sugar contents and is third highest in terms of lycopene content.
- In overall rating at No. 3, Cremica is also adjudged as value for money and is second highest in lycopene content.
- At overall No. 3, Kissan is adjudged as the topper in sensory tests.

Note: There is a difference of a mere one point each among the top three positions.





TEST RESULTS

All the samples were tested as per the test programme based on relevant Bureau of Indian Standards (BIS) and Food Safety and Standards (FSS) Rules, 2011. The testing was conducted as per standard test methods and requirements applicable to the product. The test laboratory conducted the various tests on masked and coded samples and accordingly the test report was released.

Microbiological Tests (TPC, Mould Count and Yeast and Spores Count)

Last month, all brands of paneer except Mother Dairy failed the crucial microbiological tests. In sharp contrast, all ketchup brands passed the microbiological tests. None of them surpassed the permissible total plate count (TPC), mould count and yeast and spores count. Only Safal contained TPC 290, but this too is way below the limit.

Physico-Chemical Tests

◆ Lycopene Content (mg/100gm)

Lycopene is a photochemical (naturally occurring pigment with beneficial health effects) found in tomatoes and some other plants products. It is a pigment that produces a stable red colour and has been identified as a powerful antioxidant. Antioxidants neutralize harmful substances in the body called free radicals, which may damage the body's cells and may even contribute to cancer and cardiovascular diseases.

Benefits of Lycopene

- Important for optimal health
- Potent inhibitor of human cancer and also reduces the risk of prostate and breast cancer
- A good antioxidant and a natural and stable food colouring matter; even used as a nutrient in supplement tablets for its antioxidant properties





- Heinz contained the maximum quantity of lycopene and scored highest, followed by Cremica, Del Monte, Maggi and Kissan.

◆ Preservative (Benzoic Acid), ppm

Benzoic acid is a most widely used food preservative; the presence of preservative generally increases the shelf life of the product and prevents the deterioration of nutritional values, taste and odour and microbial contamination. As per the relevant standards, the product must not contain more than 750 ppm of permissible preservatives. However, as a higher quantity of preservative is not desirable, 300 ppm is considered to be adequate quantity.

- All the brands were found well within the maximum permissible limit of 750 ppm.
- Heinz did not contain any preservative and was declared as a 'no preservative' brand; it scored the highest.

Comparative Test 1

Brands→	Weightage, %	Heinz	Maggi	Cremica	Kissan	
Parameters↓						
MRP&RP (Rs)/weight (kg)		135/1.05	120/1	115/1	120/1	
Best before (months)		12	12	12	12	
1. General						
1.1 Packaging	3	3.0	2.76	2.76	2.76	
1.2 Marking and labelling	4	4	4	4	4	
1.3 Net weight	2	2	2	2	2	
2. Sensory Tests*	25	18.45	19.54	18.48	21.37	
3. Physico-Chemical Tests						
3.1 Acidity	4	3.56	3.28	3.84	2.36	
3.2 Specific gravity	3	2.86	2.86	2.30	2.73	
3.3 Energy value	6	5.17	5.71	5.54	5.51	
3.4 Carbohydrates	5	5.0	4.41	4.67	4.60	
3.5 Total soluble solids	8	6.72	7.59	7.25	7.01	
3.6 Total sugar	6	4.99	4.81	4.16	4.01	
3.7 Added colouring matter	3	3	3	3	3	
3.8 Lycopene content	10	8.87	6.80	7.74	6.63	
3.9 Preservatives	3	3.0	2.57	2.64	2.30	
3.10 Heavy metals	2	2	2	2	2	
3.11 Viscosity	4	3.44	3.41	4	3.52	
4. Microbiological Testing**	12	12	12	12	12	
Overall Score (Rounded off)	100	88	87	86	86	

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

* Sensory panel tests include colour, consistency, flavour, defects and after-taste feeling as per IS guidelines.

** Microbiological tests include total plate count, mould count and yeast and spores count.

Ketchup

	Reliance Select	Del Monte	Tops	Safal	Tasty Treat	Smith & Jones	Pan	Mum's
								
	75/1	110/1	100/1	99/1	75/1	110/1	99/1	110/1
	12	12	18	12	12	18	12	12
	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76
	4	4	4	4	4	4	4	4
	2	2	2	2	2	2	2	2
	19.44	19.54	18.94	17.66	16.41	19.03	15.27	13.99
	3.76	3.08	3.68	3.04	3.76	2.48	3.36	3.08
	2.73	2.30	2.86	2.86	2.73	2.60	2.86	2.73
	5.69	5.30	5.63	5.93	5.44	5.1	5.64	5.50
	4.42	4.31	4.45	4.14	4.49	4.81	4.59	4.39
	7.79	7.44	7.52	7.92	7.25	6.76	7.51	7.26
	3.58	4.31	3.29	3.48	4.00	4.71	3.91	4.29
	3	3	3	3	3	3	3	3
	5.08	7.54	5.38	6.06	4.91	4.77	5.11	5.2
	2.67	1.85	2.71	2.57	2.36	2.23	2.38	2.24
	2	2	2	2	2	2	2	2
	3.76	3.04	2.31	3.60	2.93	1.61	2.00	2.02
	12	12	12	10.84	12	12	12	12
	85	84	83	82	80	80	78	76

Comparative Test 1



◆ **Acidity (expressed as acetic acid, % by weight)**

Acidity is related to the shelf life of the product. If acidity (acetic acid) is lower than the minimum limit, microbes will begin to grow, allowing contamination of the product and reducing its shelf life. As per the national standards, the product must contain at least one per cent by weight of acidity.

- All the brands were well above the minimum requirement of one per cent of acidity.

◆ **Specific Gravity at 25 °C**

The specific gravity (SG) is the ratio of density of the material to the density of water at a specified temperature. As per BIS, specific gravity should be a minimum 1.111 when tested at 26 °C.

- All the brands were found well above the minimum requirement of 1.111 of specific gravity.

◆ **Energy Value**

Energy has traditionally been expressed as calories or kilocalories. Energy requirement can be thought of as the amount needed to maintain the basic processes of life at rest, plus the amount needed for physical activity under a variety of circumstances.

- All the brands contained a significant amount of energy values.

◆ **Carbohydrates**

Tomato ketchup is a source of carbohydrates mainly due to addition of sugar as being permitted. Carbohydrates are the body's main source of fuel and found in grains, fruits and vegetables, and milk.

- All the brands contained a significant amount of carbohydrates ranging from 28.37 per cent to 34.99 per cent by mass.

◆ **Viscosity**

Higher viscosity of tomato ketchups is an indicator of good quality.

- Cremica was rated highest in viscosity, followed by Reliance Select. Smith & Jones was found with lowest viscosity.

◆ **Total Soluble Solids**

Total soluble solids (TSS) is an expression for the combined content of all inorganic and organic substances that are present in a molecular, ionized or micro-granular suspended form contained in a liquid. As per the national standards (BIS and FSS Rules, 2011), tomato ketchup must contain not less than 25 per cent of total soluble solids.

- All the brands were found above the minimum requirement of total soluble solids.
- Safal contained the highest TSS and scored highest.

◆ **Total Sugar (percentage by mass)**

This ingredient gives natural taste and uniform texture to the product besides thick density. It also acts as a preservative. The addition of sugar in ketchup may be for balancing the taste of sourness of tomatoes. The quantity of sugar should be neither very high nor very low. The weightage has been assigned with respect to the declared value as well as the resulted value.

The resulted value indicates the presence of total sugar in significant quantity; it was also verified with the declared values as ingredients and nutrition facts of all the brands.

- Except Maggi and Cremica, which showed higher variation, all the brands were closer to their declared values.

◆ **Added Colouring Matter**

Synthetic colouring material is the artificial colour that makes the product retain the original colour.

- None of the brands was found to contain synthetic colouring matter; hence all were given equal scores.

◆ **Heavy Metals (Lead and Arsenic)**

Toxics like arsenic and lead are a cumulative poison that enters either through the soil or during production. These accumulate in the body and cause irreversible damage to the brain, nerve cells, red blood cells and the kidneys. Ingestion of large amount of arsenic can lead to gastrointestinal symptoms such as severe vomiting, high blood pressure and even heart attack.



- All the brands were beyond the detection limit, meaning they do not contain harmful heavy metals.

General Tests

◆ Packing

All the brands except Heinz are packed in glass bottles with crown cap and plastic cover. Heinz comes in a pet bottle with self-locking plastic cap, which is more convenient to use with its single-twist lock.

- Heinz scored highest for packing as criteria for weightage also covered recyclability, reusability and disposability.

◆ Marking/Labelling

As per the BIS requirement, manufacturers need to mention their address, name of product, date of manufacture, best before, batch number, net weight, list of additives, green dot marking, etc., on the product label.

- All the brands tested provided the required information as per the national standards and scored equal points.

◆ Net Weight

The weight of the tomato ketchup was measured and compared with the declared values on their packaging.

- All the brands were found above the declared weight and hence were given equal scores. Heinz provided 50 grams free in the one kilogram pack.

Kissan was the most liked brand among panellists, and was followed by Maggi and Del Monte, both in second position.

Sensory Panel Tests

Sensory panel tests were conducted in the food and nutrition department of a reputed college of Delhi University, involving around 40 PG students pursuing masters in food science and some experienced faculty members having knowledge and experience of judging sensory attributes. The tests were carried out under the guidance and supervision of technical experts. The following parameters based on IS were judged by the panellists and ratings were then given on a five-point scale.

- 1. Colour:** The colour of tomato ketchup should be reasonably uniform, characteristic red and free from any blackening of surface or any discoloration.
- 2. Consistency:** Tomato ketchup should have good fluid consistency and uniform texture. It should not have tendency of separation.
- 3. Flavour:** Tomato ketchup should have an appealing flavour and should be free from any scorched, burnt or other objectionable flavour.
- 4. Absence of defects:** It should be practically free from visual defects such as seeds, skin, dark specs or other hard and coarse extraneous material.
- 5. After-taste feeling:** After-taste mouth feel should be appealing and acceptable.

Brands*↓	Score out of 25
Kissan	21.37
Del Monte	19.54
Maggi	19.54
Reliance Select	19.44
Smith & Jones	19.03
Tops	18.94
Cremica	18.48
Heinz	18.45
Safal	17.66
Tasty Treat	16.41
Pan	15.27
Mum's	13.99

* Brand names in descending order as per the scores in the test