

## Tomato Ketchup: What's your secret (best) sauce for taste?

Most commonly used as a condiment to dishes that are usually served hot and may be fried or greasy, tomato ketchup is a stable grocery product of every household. It is prepared by blending tomato juice/puree/paste of appropriate concentration with nutritive sweeteners, salt, vinegar, spices and condiments and many other ingredients suitable for product and heating to the required consistency. To ascertain the overall quality and wholesomeness of tomato ketchup, VOICE conducted the comparative testing of eight (8) popular tomato ketchup brands available in the retail markets. Keeping in view its large-scale consumption across the country, we conducted the test in a NABL accredited lab and found the best tomato ketchup brand. Here's the report.

### *A Consumer Voice Report*

The tomato ketchup samples were evaluated as per the specified test program followed by the FSSAI regulations and relevant Indian standard IS: 3882 applicable to this product. The comparative testing was conducted as per the

standard test methods in a designated NABL accredited laboratory who had conducted testing on masked and coded samples and accordingly the test report was issued to us.

### BRANDS TESTED

The table below reflects scores of different brands based on their overall performance.

Rank	Rounded off Score (out of 100)	Brand	Quantity, gms	MRP, Rs	MRP per 100 gm	Best Before, Months	Manufacturer/ marketer
1	95	Maggi	500	100	20	12	Nestle India Ltd.,
2	92	Kissan	500	99	19.8	12	Hindustan Unilever Ltd,
2	92	Veeba	360	89	24.72	9	Veeba Food Services Ltd
2	92	Snactac	500	97	19.4	12	Reliance Retail Ltd.,
3	91	Delmonte	1000	140	14	12	Field Fresh Foods Pvt. Ltd.,
3	91	Patanjali	1000	130	13	12	Patanjali Ayurved Limited,
4	90	Cremica	950	155	16.31	12	Cremica Food Industries Ltd.,
5	89	Heinz	600	160	26.66	24	Heinz India (P) Ltd.

### Key findings

- Brand Maggi performed on top followed by Kissan and Veeba.
- Snactac is the Value for Money product with MRP Rs.97 and purchased price at Rs.69.
- Kissan performed highest in sensory panel tests followed by Maggi and Cremica.
- Patanjali has highest level of lycopene followed by Maggi/Snactac.
- Heinz and Veeba are the brands that do not contain any preservative.
- Highest total soluble solid was found in Veeba and lowest in Heinz. Veeba claimed highest sugar.
- Salt was highest in Heinz and lowest in Kissan.
- The brands claim sugar between 23 to 39.2 gm per 100 gm. There is no requirement for added sugar in national standard.
- All the brands met the minimum requirements specified in the national standards, thus safe for consumption.
- All the brands were found safe for consumption as heavy metal (arsenic and lead) and microbiological tests (total plate count, mould count and yeast & spores) were found well within the specified standard limits.

### CV RECOMMENDATIONS

TOP PERFORMER

**Maggi**

VALUE FOR MONEY

**Snactac**





**COMPARATIVE PERFORMANCE (SCORE) OF TOMATO KETCHUP**

Brands									
Parameter	Wt. %	Maggi	Kissan	Veeba	Snactac	Delmonte	Patanjali	Cremica	Heinz
<b>TEST PARAMETERS</b>									
Packing	2	2	2	2	2	2	2	2	2
Marking	3	3	3	3	3	3	3	3	3
<b>Physicochemical tests</b>									
Net weight	3	3	3	3	3	3	3	3	3
Product Fill	3	2.64	2.99	2.81	2.70	2.45	2.76	2.76	2.49
Total soluble solids	8	7.18	6.62	7.44	7.40	6.98	7.36	7.08	5.74
Acidity as acetic acid	5	4.1	3.8	4.4	4.1	4.1	4.1	4.4	5.0
Preservative as Benzoic acid	4	3.47	2.62	4.0	3.11	2.71	2.81	2.78	4.0
Lycopene	12	11.52	9.60	10.56	11.52	10.56	12.00	8.40	9.12
Salt as NaCl	5	4.60	5.0	3.80	4.4	4.2	4.2	4.2	3.0
<b>Heavy Metals</b>									
Arsenic	3	3	3	3	3	3	3	3	3
Lead	3	3.0	3.0	3.0	2.70	2.55	3.0	2.55	3.0
Sensory Tests	40	38.45	38.63	36.25	35.81	37.87	34.6	38.22	36.54
<b>Microbiological Tests</b>									
Total Plate Count	3	3	3	3	3	3	3	3	3
Mould Count	3	3	3	3	3	3	3	3	3
Yeast & Spores Count	3	3	3	3	3	3	3	3	3





### TEST PARAMETERS

Sensory Tests | Lycopene content | Total Soluble Solids | Salt as NaCl | Acidity expressed as acetic acid | Preservative as Benzoic Acid | Toxic Metals | Arsenic | Lead | Microbiological Tests |

Packaging | Marking/ Labelling | Net Weight | Fill Product |

### Sensory tests

Tomato ketchup is fun food and taste enhancer consumed in limited quantity therefore this parameter is the most important and given the highest point of 40 per cent. Sensory panel tests were conducted in test lab involving experienced lab scientists under the guidance/supervision of technical experts. The tests were conducted as per the specifications laid down in the Indian standard including colour, consistency, taste and flavour and absence of defects.

Following parameters were tested by the panelists and given scores based on their judgements.

1. Colour
2. Consistency
3. Taste & Flavour
4. Absence of defects

Kissan performed highest in sensory panel tests followed by Maggi and Cremica.

### Lycopene content

The more the lycopene, the more is the ripened tomato content. Low levels of lycopene indicate the use of either less or unripe quantity of tomato pulp or poor quality of tomatoes. There is no specified requirement for lycopene in the BIS or Food Safety and Standards Regulations. Lycopene is a strong antioxidant and linked to health benefits. Patanjali was found with highest lycopene content followed by Snactac and Maggi.

### Total soluble solids

A total soluble solid is an expression for the combined content of all inorganic and organic substances. The main ingredients of the tomato ketchup are water, tomato paste, sugar, salt and a minor quantity of vinegar, spices, preservative, etc. As per the national standards (BIS & FSS Regulations), tomato ketchup should not have less than 25 per cent of total soluble solids. All the brands were found well above the minimum requirement of 25 per cent. Highest total soluble solid was found in Veeba and lowest in Heinz. High total soluble solid may occur mostly because

of excess added sugar *in tomato ketchup*. The National standard body should specify maximum added sugar requirement in standard as sugar was declared 23- 39.2 per cent in the tested tomato ketchups.

### Salt as NaCl

There is no requirement specified in FSSAI and BIS. Salt is used in tomato ketchup as taste enhancer therefore It should be in moderate quantity. Sodium chloride is a [salt](#) used commonly to balance the taste. Salt was highest in Heinz (3.5 per cent) and lowest in Kissan (2.5 per cent).

### Acidity expressed as acetic acid

Acidity related to the shelf life of the product. If acidity (acetic acid) is lower than the minimum limit, microbes may grow and will allow contamination of the product thereby reduce the shelf life of the product. As per the FSS regulation, it shall not be less than 1.0 per cent and as per the BIS requirement, 1.2 per cent is minimum. All the brands were within limit of standard thus passed the test.

### Preservative as Benzoic Acid

Benzoic Acid is a preservative. The presence of preservative generally increases the shelf life of the product and prevents the deterioration of nutritional values, taste, odour and microbial contamination. However, an excess amount of preservative is not desirable. As per the standards, the product should not contain more than 750 ppm (parts per million) of permissible preservative. All the brands were found within the limit. Benzoic acid was not detected in Heinz and Veeba as claimed by them.

### Toxic metals

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 a large amount of arsenic can lead to gastrointestinal

symptoms such as severe vomiting, high blood pressure and even heart attack.

The permissible limit for arsenic in tomato ketchup is a maximum 1.1 ppm, and for lead it is a maximum 2.5 ppm.

### Arsenic

Req-1.1 PPM Max. All the brands were well within the limit of standard.

### Lead

Req-2.5 PPM Max.

All the brands were found within the specified limit. Lead was detected in Snactac (0.2ppm, Cremica (0.3ppm) and Delmonte (0.3ppm).

### Microbiological tests (Yeast, Mould & Bacteria)

Microbiological contamination is a very important factor in determining the quality of food products. Microbiological tests were conducted for three major microbes present in food products as TPC (total plate count), mould count and yeast & spores count. These microorganisms are responsible for many food borne disease. Due to the improper or poor manufacturing practices microorganisms occur in the finished product. As per the national standards, the product shall comply to the following requirements:

Total Plate Count: - Not more than 10000/ml

Yeast & Spores: - Not more than 125 per 1/60 c.m.m

Mould Count: - Positive in not more than 40 per cent of the field examined.

All the brands passed this test.

### Packaging

Packing is an important part of the product for maintaining its consistent quality. Packaging should be user friendly in shape and size. Seven out of eight brands were packed in glass bottle,

## Comparative Product Testing

only brand Veeba was packed in PET bottle.

### Marking/labeling

Following information should be there on the product label:

- a) Name of the material
- b) Name & address of the manufacture
- c) Batch number
- d) Date or month of manufacture
- e) Net weight of the contents (in gms/kilograms)
- f) List of ingredients
- g) FSSAI license no
- h) Green Dot Mark (Vegetarian mark)
- i) MRP in Rs
- j) Best Before Month & year
- k) Instructions for storage and use
- l) Nutritional facts/information
- m) Customer care contact details

All the brands had proper labeling/markings.

### Net weight

The weight of the tomato ketchup was measured and compared with the declared values on their packaging. Legal metrology rule has specified different tolerances for different sizes of packs. All the brands passed in this test as they were found carrying the declared net weight.

### Product fill

The container shall be well filled with the product and shall occupy not less than 90.0 per cent of the net weight of the container, when packed in the rigid containers. The net weight of the container is the volume of distilled water at 20°C which the sealed container is capable of holding when completely filled. Kissan scored highest in this parameter followed by Veeba and Cremica / Patanjali.



### Conclusions

Tomato ketchups are a super taste enhancer for sure. However, just because tomato ketchup is a perfect match for those foods, one should not consume it a lot. Therefore, moderate consumption is advisable since ketchups contain preservatives, sugar, salt, and vinegar. Too much consumption of tomato ketchup for a long period may have some adverse effects on human health.

We have evaluated eight different tomato ketchup brands as per the relevant national standards so that the consumers buy only the best. All the brands met the minimum requirements specified in the national standards, making them safe for consumption. All the brands were found safe for consumption as heavy metal (arsenic and lead), microbiological tests (total plate count and mould count and yeast & spores) found well within specified limits of standard. Therefore, seven out of eight brands fall in very good category scoring over 90 per cent. Brand Maggi performed on top among the brands tested. Kissan performed highest in sensory panel tests.