



## Mixed Fruit Jam : Choosing the best!

What was the last time you went to buy a mixed fruit jam and was confused in choosing it in a few seconds? Well, if you are one who thinks twice before buying any product, then the below test report is meant for you. It contains an evaluation report of 10 mixed fruit jam that has singled out the best brand from the lot.

*A Consumer Voice Report*

**F**ruit jams are generally prepared from sound, ripe, fresh, dehydrated, frozen or previously packed fruits including fruit juices, fruit pulp, fruit juice concentrate or dry fruit by boiling its pieces or pulp or puree with nutritive sweeteners namely sugar, dextrose, invert sugar or liquid glucose to a suitable consistency. It may be prepared from any of the suitable fruits, singly or in combination. It shall have the flavor of the original fruit (s) and shall be free from the burnt or objectionable flavors, foreign/extraneous matters and crystallization.

### How We Test

The test program for comparative testing was mainly based on FSS Regulations however some important consumer centric parameters were adopted from other relevant national standards i.e. IS: 5861:2019 (specifications for jams, jellies and marmalades) to evaluate the regular/most selling brands of mix fruit jams marketed in packaged condition. The testing laboratory utilized was accredited and reputed one in the food testing segment.

### Brands Tested

Ten mix fruit jam brands were purchased from retail markets for comparative testing.

Rank	Score	Brand	Pack Quantity, gm	MRP/Retail Price in Rs.	Best before, months	Manufacturer/Marketer
1	93	Snactac	200	70/70 (buy one get one free)	12	Reliance Retail Limited
2	92	Mother's	500	135/135	12	Delicea Food India Pvt Lt
2	92	Mapro	200+60 (free)	63/60	18	Mapro food pvt ltd
2	92	SIL	500	140/140 (560 for 4)	18	Scandic Food India Pvt Limited
3	91	Safal	1000	125/125	12	Mother Dairy Fruit And Vegetable Pvt Limited
4	90	Mala	1000	165/241	12	Mala's Fruit Product
4	90	Patanjali	500	100/100	18	Patanjali ayurved Ltd
5	89	Kissan	200	65/63	12	Hindustan Unilever Limited Nasik
5	89	Cremica	480	150/75	12	Mrs. Bectors Food Specialities Limited
6	88	Tops	475	135/125	18	GD food Pvt Ltd

Rating: >90 – Excellent \*\*\*\*\*, 71-90- Very Good \*\*\*\*, 51-70- Good \*\*\*, 31-50- Average \*\*, upto 30 – Poor

#### CV Recommendations

**Snactac**

**Value For Money Brand**

**Safal**

#### Key Findings

- Based on the overall scores, Snactac performed on top followed by Mother's and Mapro among the brands tested.
- Brand Safal is our choice for 'value for money' on the basis of its performance and cost.
- Kissan scored highest in the sensory tests, followed by Snactac and SIL.
- Highest fructose was found in Patanjali followed by Tops and Mother's and lowest in Mala.
- All the brands have met the total soluble solids (TSS) requirements.
- Toxic metals such as Lead, Arsenic, Copper and Tin were well within the limit of standard in all the tested products.
- It is revealed from products' claims that they contain the maximum amount of sugar. Consumers are advised to consume jam in limited quantities depending upon their age.

## For Quality and Performance

COMPARATIVE PERFORMANCE (SCORES) OF MIX FRUIT JAM											
Brand	Wt. %	Snactac	Mother's	Mapro	Sil	Safal	Mala	Patanjali	Kissan	Cremica	Tops
Total Soluble Solids	12	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Fructose	8	6.67	7.74	7.54	6.72	7.65	5.58	8.00	6.10	6.59	7.78
Sucrose	6	5.67	5.79	6.00	5.38	5.76	4.23	5.93	4.61	4.72	5.65
Total Sugar	5	4.39	4.07	4.40	3.86	4.03	4.16	3.64	3.94	3.85	3.91
Carbohydrate	6	5.18	5.23	4.70	5.40	5.20	5.26	4.25	4.73	5.50	4.66
Pectin	5	3.80	4.60	3.80	3.40	3.40	4.60	3.40	4.20	3.00	3.40
Preservative	5	4.35	3.48	3.89	4.46	3.03	4.01	3.47	3.12	4.12	3.56
Total Ash	5	4.70	4.70	4.90	4.70	4.70	4.70	4.40	4.40	4.40	4.40
Minimum Fill	4	3.46	3.32	3.54	3.52	3.30	3.94	3.65	3.24	3.47	3.23
Freedom from Extraneous matter	3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Metallic contaminants (Pb,As,Sn,Cu)	8	7.87	7.84	7.84	7.76	8.00	7.84	7.60	7.88	7.47	7.25
Mould, Yeast & Spores	7	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Sensory tests	20	18.81	17.56	17.60	18.73	18.49	18.39	17.66	19.14	17.71	15.74

### Comparative Testing of Mix Fruit Jam

The comparative testing was carried out in a reputed and accredited laboratory. The test program was mainly based on the FSSR and other relevant national standards applicable to the product. The primary objective was to assess and evaluate the regular/most-selling brands of mix fruit jam traded in the retail market in packaged condition. It may be noted that while fruit contents quantification method is yet to be established, there are other parameters that determine the quality of a good fruit jam as well. Fruit jam is one of the processed foods which is consumed by a large chunk of the urban and semi urban population. It is estimated that the normal

one-time consumption by an individual touches two tablespoons among adults as well as children. It will help to remember that a large part of the intake is in the form of sugar, which is the major ingredient as per the test results as well as the label declaration. Therefore, intake quantity has to be monitored while regularly consuming fruit Jam.

Ten brands of mix fruit jam went through comparative testing on parameters such as total soluble solids, fructose, sucrose, total sugar, carbohydrate, preservative and pectin (gelling agent). The brands were further subjected to tests for presence of heavy metals (lead, arsenic, copper and tin), microbiological and sensory tests.

## Comparative Test

The fruit content in jam shall be not less than 45 per cent by mass, except in strawberry, raspberry jam where the minimum fruit content shall be not less than 25 per cent by mass.

### Test Parameters

Following test parameters were covered in the comparative testing:

#### Sensory evaluation

Sensory tests are very important to consumers/users as acceptance of food product. Sensory evaluation measures, reactions of people to products as perceived by the senses. It is a means of determining whether product differences are perceived whether one product is liked more than another. Sensory tests were conducted in the laboratory under the guidance and supervision of technical experts. The panelists judged the following parameters on 9-point hedonic scale

1. Colour & Appearance
2. Aroma/Flavour
3. Texture
4. Taste
5. After Taste feeling
6. Overall acceptability



And the sensory evaluation scores on 9-point hedonic scale are as follows

S.No	Brands	Colour	Aroma	Texture	Taste & after taste	Overall Acceptability	Scores obtained out of 20
1.	Kissan	8.7	8.5	8.5	8.7	8.6	19.14
2.	Snactac	8.3	8.6	8.5	8.4	8.5	18.81
3.	SIL	8.7	8	9	8.3	8.5	18.73
4.	Safal	8.3	8	8.5	8.2	8.3	18.49
5.	Mala	8.5	8.3	8.7	8	8.4	18.39
6.	Cremica	8.3	8.2	7.5	8	8	17.71
7.	Patanjali	8.2	7.8	8.3	7.8	8	17.66
8.	Mapro	8	7.7	8.2	7.9	7.9	17.60
9.	Mother's	8.2	7.5	8.3	7.8	8	17.56
10.	Tops	7.6	7.3	7	6.9	7.2	15.74

So, as per the table above, we see that highest and top sensory score was obtained by Kissan followed by Snactac and SIL.





### Total soluble solids

The total mass of a jam is made up of ingredients like sugar, fruit pulp, pectin, preservatives, and other soluble solids present naturally or added in combining form. All of these make the 'total soluble contents' of a jam. High total soluble contents do not necessarily denote high fruit pulp since sugar, pectin and other ingredients also increase the amount of total soluble contents. Fruit content should not be less than 45 per cent.

FSSR specifies requirement of total soluble solids not less than 65 per cent of the total weight. Indian Standard specifies that the total soluble solids (TSS) should be at least 68 per cent of the total weight. All the brands were found above the minimum requirement set by the national standards- the highest total soluble solid was found in Patanjali, and the lowest being that of Mala. Basically, it is the fruit content and the quality of the fruit which is decisive for the quality of the jam. It is not just fruit content that goes on to make a bottle of jam.

### Microbiological tests

Microbiological contamination is a critical factor

in determining the quality of food products. The tests were conducted for mould count as well as yeast and spores' count. These microorganisms are responsible for many food-borne diseases. Due to improper or poor manufacturing practices, microorganisms occur in the finished product. Mould count and yeast and spores were absent in all the brands thus safe for consumption.

### Fructose

Fructose is naturally present in ripened fruits. Fructose also known as fruit sugar is a simple sugar as sweet as table sugar. Fructose is an indicator of sugar coming from fruit pulps/juices in jam. There is no requirement in the national standard. Highest fructose was found in Patanjali followed by Tops and Mother's. Lowest fructose was found in Mala.

### Sucrose

Sucrose is commonly known as table sugar. There is no requirement in standard. Highest sucrose found in Mala and it was lowest in Mapro and Patanjali.

### Total sugar

Sugar gives a natural taste and uniform texture to



jam, in addition to thick density. It also acts as a preservative. We expect the quantity of sugar to be neither very high nor very low. In the case of the jam we tested, the resulting value indicates the presence of total sugar in significant quantity. It is revealed from the product's label declaration that it contains the maximum amount of sugar. Therefore consumers are advised to consume jam in limited quantities depending upon their age. However lowest sugar was found in Mapro and Snactac.

### **Carbohydrate**

Carbohydrates are the body's main source of fuel. These raise your blood sugar more than any other nutrient. When you ingest any type of carbohydrates, they are broken down into glucose and enter your bloodstream. The hormone insulin helps the cells in your body to take up this glucose and use it for energy. There is no requirement in standard. Carbohydrate was found highest in Patanjali and lowest in Cremica.

### **Preservative**

The presence of preservatives generally increases the shelf life of the product and prevents the deterioration of nutritional values, taste. Benzoic Acid is a very common preservative usually added to prevent growth of moulds, yeast and other bacteria. People suffering from gastric or acidity problems would do well to keep away from processed foods that have high Acid content.

National standards allow for a maximum of 200 ppm of Benzoic Acid content in jam. National standards allow for a maximum of 40 ppm of SO<sub>2</sub> in jam. Sorbic Acid shall be 500 ppm maximum in jam. Preservative was in the specified limit in all the brands. However, it was lowest in SIL followed by Snactac and Cremica.

### **Pectin**

Indian standard (BIS) allows one per cent pectin maximum. The most common gelling agent, pectin





also causes jam to solidify. It is not desirable for jam to have high pectin content beyond permitted limits. We found all the brands were within the standard limit. Mother's and Mala scored highest followed by Kissan.

#### **Freedom from extraneous vegetable materials**

The product shall be free from extraneous vegetable materials normally associated with the fruits such as peels (excluding marmalades), skin, pits, pit fragments, etc. All the brands were free from extraneous vegetable materials.

#### **Total ash**

The test identifies the total filler content in the product. The ash content of a foodstuff is the residue remaining after all the moisture has been removed and the organic material has been burnt away. There is no requirement in the standard however total ash should be in minimum. The total ash was detected between 0.05 – 0.2 per cent by mass. Lowest total ash was found in Mapro.

#### **Minimum fill**

Containers should be filled as commercially practicable. As per the Indian standard (BIS), Jam shall occupy not less than 90 per cent of the water capacity of the container. When the product

is packed in glass containers, the water capacity shall be reduced by 20 ml.

All the brands were within the standard limit. However, the highest fill was found in Mala followed by Patanjali and Mapro..

#### **Heavy metals**

We tested the jam for presence of heavy metals such as arsenic, lead, copper, zinc and tin. Lead, a cumulative poison, enters either through the soil or during production. It accumulates in the body and causes 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, heart attack, etc.

#### **Lead**

All the brands were within the standard limit.

#### **Arsenic**

All the brands were within the standard limit.

#### **Copper**

All the brands were within the standard limit.

#### **Tin**

All the brands were within the standard limit.

Safal scored highest in this parameter followed by Kissan and Snactac.

### Packaging

The product shall be packed either in glass bottles or in hermetically sealed, sanitized cans made from tin plates that are inside lacquered or in food-grade plastic containers or aseptic packages, preferably having tamper proof provision. Safal and Mala Jam were packed in plastic bottles, rest eight brands were packed in glass bottles.

### Marking

The following particulars should be marked or labeled on each container

- a. Name of the product with the brand name.
- b. Name and address of manufacture.
- c. Net content in grams.
- d. Month and year of manufacture.
- e. Batch or code number if any.
- f. List of ingredients in descending order.
- g. List of additives, if used.
- h. Best before.
- i. Manufacturing license number.
- j. MRP.
- k. Veg green dot mark.
- l. Storage instruction mark.

All the brands have provided information as mentioned above.

### Conclusion

Fruit jam is one the FMCG processed food that is consumed by a mass population where it is predominantly consumed with the bread slices as a part of the breakfast among the adults as well as children. But the majority of the intake is in the form of sugar which is the major ingredient as per the test results as well as the label declaration. Therefore, intake quantity needs to be taken care while regularly consuming the fruit jam.

Since the fruit contents quantification method is yet to be established, fructose can be an indicator of fruit contents though a few other parameters also constitute and reflect about the quality of a good fruit jam preparation.

Since all the brands meet the FSSR requirements, hence they have met the quality and safety parameters satisfactorily. Looking into the overall quality, brand Snactac comes on the top followed by Mother's and Mapro. Safal is a good value for money brand.

### Tips for Consumers

How to tell if your jam is bad, rotten or spoiled? The first sign of caution with most jam is when a liquid begins to form on the top of the product. The consistency becomes thicker and the colour becomes darker. Then it can develop an unpleasant odour, which is almost always followed by an unpleasant flavour and then mould. Once there is any mould at all present, the entire jar must be tossed. Mould spreads very quickly in a soft environment like jam or jelly, whether you can see it on the bottom of the jar or not. Mould spores that can cause serious illness can spread quickly and easily through the entire jar. It's a good idea to put a label on the product indicating the date it was opened, and, before consuming, to examine it carefully for evidence of deterioration, especially mould.

**How to store the jam to extend its shelf life?** All preserved fruits should be stored in a cool dry environment not susceptible to temperature change. When items go through temperature changes of cool to warm and vice versa, the moisture in the air tends to condensate inside the packages. This moisture allows mould to grow and your jam to spoil. You should always make sure to use clean utensils when serving jam in order to avoid cross-contamination. Normally, there is no need to store jam in a fridge. In general, jam lasts only as long as the quickest expiring ingredient it is mixed with.