

**National Milk Safety and Quality
Survey
Executive Summary**

In the backdrop of the perception that milk in India is largely adulterated, Food Safety and Standards Authority of India (FSSAI) carried out a survey on safety and quality of liquid milk in the country, referred to as 'National Milk Safety and Quality Survey 2018'. This Survey was carried out from May 2018 to October 2018 covering all States and UTs.

A total of 6,432 samples of milk were collected from 1,103 towns/cities with population above 50,000. Samples were collected both from the organized (retailers and processors) as well as non-organized (local dairy farms, milk vendors and milk *mandis*) sectors. Number of samples collected was linked to population at the sampling locations and covered raw milk as well as various types of processed milk. The survey results demolish the perception of large scale adulteration of milk in the country.

While, all samples collected were uniformly tested on the spot for critical parameters of quality and safety. The samples found to have any contaminants and adulterants were subjected to confirmatory analysis using high-end equipment and employing established testing protocols by proficient analysts in NABL accredited and FSSAI recognized laboratories. The survey was carried out by an independent third party agency. It is first-of-its kind extensive self-designed, representative and most comprehensive survey of safety and quality of liquid milk so far.

Earlier, FSSAI had carried out milk surveys in 2011 and 2016 with sample size of 1791 and 1663 respectively. Even though these surveys were informative, but these were inadequate as no clear picture emerged from these surveys due to small sample size and testing done by different laboratories that did not follow uniform protocol. Moreover, only qualitatively analysis was done and required safety parameters were not covered in the survey.

The survey has shown that 12 out of 6,432 samples of milk were adulterated that render such milk unsafe for human consumption. Six samples were found adulterated with hydrogen peroxide, three with detergents, two with urea and one sample was found to have neutralizers. No samples were found with boric acid and nitrates, the other two possible adulterants. Out of 12 adulterated samples, nine were in Telangana, two from Madhya Pradesh and one from Kerala. While, this is a concern, but is far from the common perception that liquid milk in the country is largely adulterated.

A major finding in the survey was presence of aflatoxin M1 residues beyond permissible limits in 368 (out of 6,432) samples, that is 5.7% of the samples. This is the first time that presence of aflatoxin M1 in milk has been assessed. Aflatoxin M1 comes in the milk through feed and fodder, which are currently not regulated in the country. Amongst the top three States with highest levels of aflatoxin M1 residues are Tamil Nadu (88 out of 551 samples), Delhi (38 out of 262 samples) and Kerala (37 out of 187 samples). This problem is more dominant in processed milk rather the raw milk.

The survey further showed that 77 (out of 6,432) samples, that 1.2 % of the samples had residues of antibiotics above the permissible limits. Amongst the top three States with highest levels of aflatoxin M1 residues are Madhya Pradesh (23 out of 335 samples), Maharashtra (9 out of 678 samples) and UP (8 out of 729 samples). Only one raw milk sample in Kerala was found to contain pesticide residue above the permissible level.

For the first time, a quantitative analysis of all samples that failed on account of adulterants and contaminants has been done. This analysis has shown that level of adulterants and contaminants in failed samples is not high, and unlikely to pose serious threat to human health. The survey has also helped in identification of hot spots, so that more intensified efforts for surveillance and enforcement could be taken up in such areas.

Overall, above 93% of the samples that is 5976 out of 6,432 samples were found to be absolutely safe for human consumption. This is undoubtedly good news for the Indian consumers.

The survey has shown that about 41% samples, though safe, fall short of one or another quality parameter or standard. There is non-compliance on account of low fat or low SNF (solids not fat), two key quality parameters both in raw and processed milk. In raw milk, proportion of fat and solids not fat (SNF) varies widely by species and depends on breed as well as quality of feed and fodder. Cattle must be properly fed and good farm practices must be adopted to improve the amount of fat and SNF in milk. Thus, low fat and SNF for these reasons or due to dilution of milk with water is understood. Non-compliance on account of fat and SNF in standardized and processed milk is however surprising.

Presence of maltodextrin in 156 (out of 6432) samples and sugar in 78 (out of 6432) samples mainly confined to processed milk was yet another surprise from this survey.

Maltodextrin and sugar are not unsafe but are sometimes added to raise the level of fat and SNF of milk. While, these do not represent threat to human health, nevertheless, these incidences are preventable and stringent action is required to curb them. The survey did not find any non-compliance on account of other parameters viz. cellulose, glucose, starch and vegetable oil was not found in the collected samples.

The interim report was published in November, 2018. The report was finalized after detailed discussions with stakeholders. It was discussed and accepted in a meeting of stakeholders held on September 9, 2019. This group of stakeholders was of the view that while incidents of adulteration cannot be ruled out, but these are restricted to few areas and in times when there is large demand-supply gap. Such incidents can only be tackled by having strict vigil in such areas.

The stakeholders' group further deliberated on presence of ammonium sulphate in milk. After careful review of scientific opinion, the group reached a conclusion that ammonium sulphate is coming into the milk naturally and is absolutely safe and not a contaminant as earlier thought. It was noted that ammonium sulphate is allowed as an additive in certain foods in several countries.

The outcome of the survey is a myth buster. The survey results indicate clearly that milk being sold in India is largely safe for consumption. This is contrary to the popular perception carried by the consumers owing to misrepresented information for various reasons including deceitful campaigns and unsubstantiated reports. This misrepresented information also engulfed the true results of previous two experimental surveys by the FSSAI that resulted in avoidable and disproportionate scare in the minds of the Indian consumers.

It is however imperative that the milk safety and quality are maintained. In general, milk safety relates to freedom of milk from adverse effects on human health upon consumption and milk quality is the sum total of desirable quality attributes of milk. Despite most sincere efforts, there remains a possibility that certain contaminant(s) (undesirable substances not intentionally added but unavoidably present owing to environmental contamination or food production and handling practices) and/or adulterant(s) (substance not legally allowed but added to food by unscrupulous elements for undue profits) find their way into milk. This may sometimes result in milk quality and/or safety issues. The desired approach to ensure

food/milk safety is to make all the possible efforts during all the stages of food production and handling that the levels of contaminants in food at the time of consumption are below safe levels. And that is being done.

While the survey results effectively counter wrong perception of large scale milk adulteration in India, but non-compliance on quality parameters, particularly in processed milk is a matter of concern. This has been taken up with all the dairies for initiating corrective and preventive action. Safety concerns due to contaminants would be addressed by monitoring the quality of cattle feed that appears to be a potential source of contamination of milk. Further, FSSAI has developed a standardized 'Scheme of Testing and Inspection (STI)' of milk by dairy processors at different stages of the value chain to ensure proper internal controls. The report also contains state-wise detailed factsheets with hotspot areas of safety concerns.

Access the full report here

https://fssai.gov.in/upload/uploadfiles/files/Report_Milk_Survey_NMQS_18_10_2019.pdf

Access the Detect Adulteration with Rapid Tests (DART) book

https://fssai.gov.in/upload/knowledge_hub/1878035b34b558a3b48DART%20Book.pdf

Access the Guidance document for milk products

https://fssai.gov.in/upload/uploadfiles/files/Guidance_Note_Traditional_Milk_Products_18_10_2019.pdf