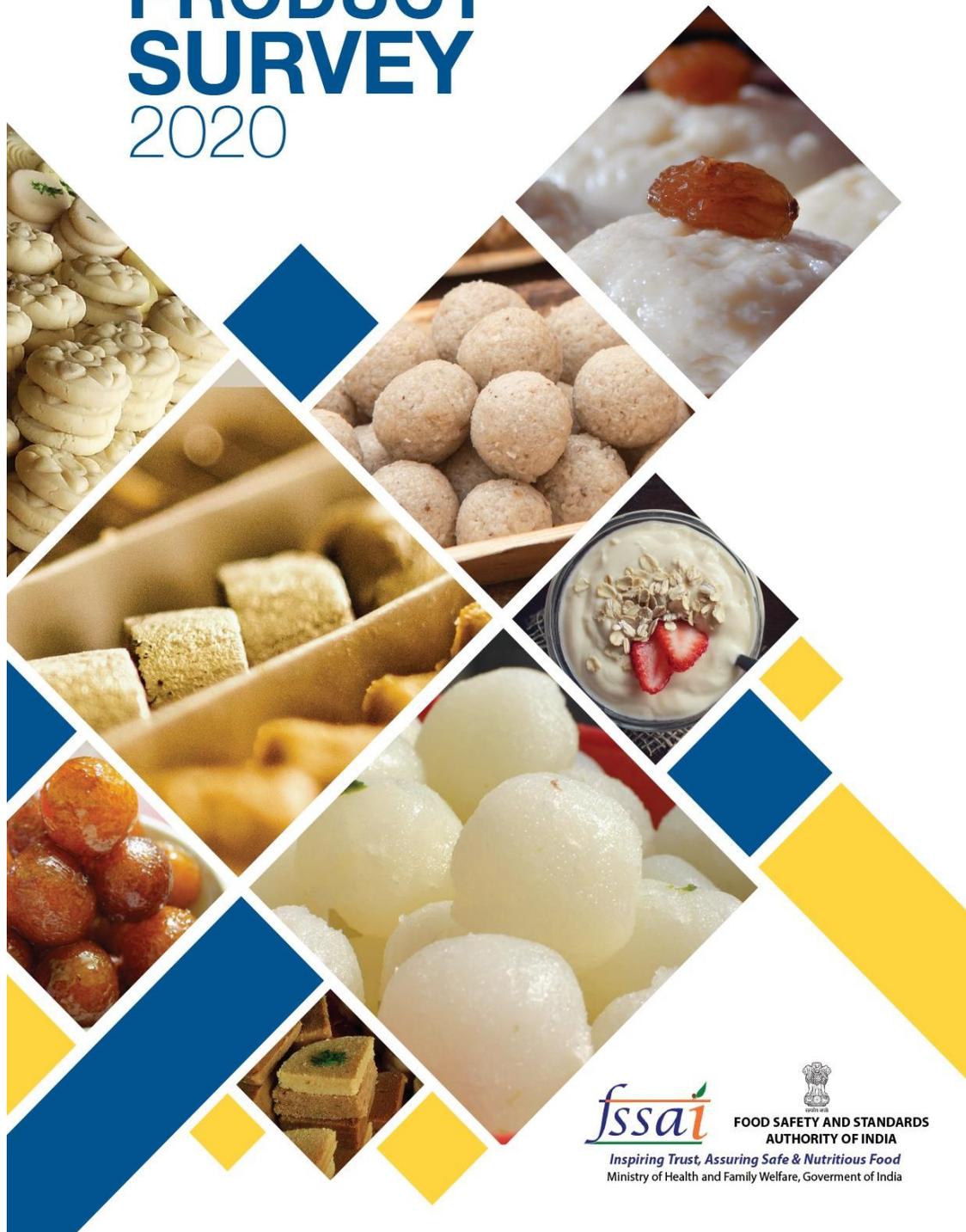


# FSSAI MILK PRODUCT SURVEY 2020



*fssai*

FOOD SAFETY AND STANDARDS  
AUTHORITY OF INDIA



*Inspiring Trust, Assuring Safe & Nutritious Food*  
Ministry of Health and Family Welfare, Government of India

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### EXECUTIVE SUMMARY

- ❖ FSSAI conducted a National level “Milk Product Survey-2020” to assess quality and safety issues in milk products being sold in Indian markets during the festival period and to identify hotspots of adulteration and contamination occurring across the country. The survey was conducted just before Diwali festival, across 27 States and UTs of India on 12-13 November 2020, with sample collection up to the district level through Food Safety Officers (FSOs) of the States/ UTs. In all, 2801 samples of milk products were collected which comprised of 510 samples of Paneer, 363 samples of Khoa, 76 samples of Chhena, 1256 samples of Khoa based desserts and 596 samples of Chhena based desserts. These samples were analyzed for various parameters, broadly grouped into chemical and microbiological categories. The chemical category was further bifurcated into safety and quality indicators, while the microbiological category was bifurcated into safety and process hygiene indicators. FSSAI notified laboratories of National Collateral Management Services Limited (NCML) were involved in the analysis of milk product samples. The salient findings of the survey are reported below and the figures mentioned in the parenthesis are part of the total number of samples collected during the study.
- ❖ Out of a total of 2801 samples analysed, 433 samples were drawn from the organized sector while 2368 samples were drawn from the unorganized sector. The samples which had details on the package as per the FSS (Packaging and Labelling) Regulations, 2011 were considered as organized sector samples, while unpacked or packed samples not having any labels were considered as samples drawn from the unorganized sector. Samples drawn from small dairies and sweet shops having valid FSSAI Licenses or Registrations and which displayed proper labelling information were also considered as organized sector samples.
- ❖ All samples were analysed for quality and safety aspects as per the requirements laid down under Food Safety & Standards Regulations, 2011. The quality aspects were tested by analyzing the sample for chemical quality parameters (Moisture, fat, Butyro-Refractometer (BR) reading, total ash, added starch and sugar etc.) and microbiological process hygiene indicators (Aerobic Plate Count or APC, coliforms, yeast and molds, *E. coli* and *S. aureus*). The safety aspects were checked by analyzing the sample for chemical safety parameters (like heavy metals, pesticide residues, melamine etc.) and microbiological safety indicators (*Listeria monocytogenes* and *Salmonella spp.*).
- ❖ The samples which did not meet the specified criteria with respect to chemical quality parameters (moisture, fat, BR reading, total ash, added starch and sugar etc.) and microbiological process hygiene indicators (APC, coliforms, yeast and molds, *E. coli* and *S. aureus*) were grouped as “substandard” samples, while those samples which failed to meet safety aspects viz., chemical safety parameters (heavy metals, pesticide residues, melamine) and microbiological safety indicators (*Listeria monocytogenes* and *Salmonella spp.*) were grouped as “unsafe”.

- ❖ All the samples drawn from organized sector were found compliant with labelling requirements laid down under FSSR, 2011. Further, all samples from the organized sector were found to be compliant for both chemical and microbiological safety parameters and none were found to be unsafe.
- ❖ In the organized sector, out of the 433 samples analysed, 25.9% (112) samples were found substandard on account of either microbiological hygiene indicators (110 samples; 24.8%) or chemical quality parameters (16 samples, 3.69%) or both which is indicative of compromise in hygiene or quality parameters in organized sector.
- ❖ Overall, 1.98% (47) samples were found to be unsafe but only due to microbiological indicators. ~40% (1131) of samples were found substandard on account of microbiological hygiene indicators or chemical quality parameters or both indicating poor sanitation practices and hygiene conditions in the processing units, adulteration with foreign fat, high moisture content, milk fat below specified limits and so on. 1.65% (6) samples of Khoa were non-compliant to meet the specifications of BR reading as per Food Safety and Standards Regulations (FSSR) indicating a possible adulteration with foreign fat.
- ❖ All the tested samples from unorganized sector were found to be compliant with respect to chemical safety parameters. However, 1.98% (47) samples were found unsafe due to the presence of pathogenic bacteria viz. *Listeria* and *Salmonella*.
- ❖ In the unorganized sector, 36.37% (1019) samples were found substandard on account of microbiological hygiene indicators (934 samples; 33.3%) and chemical quality parameters (245 samples; 8.74%) while 1.6% (45) samples were non-compliant to both chemical quality and microbiological hygiene parameters.
- ❖ Out of total 2801 samples, 872 were non-compliant exclusively on account of microbiological parameters including both safety and process hygiene parameters. 95.1% (830) samples were non-compliant specifically in hygiene criteria i.e., aerobic plate count, yeast & mold count, coliform count, *E. coli* and *S. aureus* while 4.9% (42) samples failed in safety and hygiene parameters (40 samples in both and 2 samples exclusively in safety).
- ❖ In Chhena, 76 samples were collected from unorganized sector only as no sample was available in the organized sector. Out of the samples collected, 2.6% (2) samples were found unsafe, while 56.6% (43) samples were found substandard on account of microbiological hygiene indicators (37 samples; 48.7%) and chemical quality parameters (11 samples; 14.5%).
- ❖ In Paneer, out of the 510 samples analysed, 25.1% (128) samples belonged to the organized sector, while 74.9% (382) samples were drawn from the unorganized sector. In the organized sector, none of the samples was found unsafe on account of microbial safety parameters, while 62.5% (80) samples were found to be substandard on account of process hygiene indicators (79 samples; 61.7%) and

chemical quality indicators (14 samples; 10.9%). In the unorganized sector, 5% (19) samples failed on account of microbial safety parameters while 76.2% (291) samples were found to be substandard on account of process hygiene indicators (242 samples; 63.4%) and chemical quality indicators (141 samples; 36.9%).

- ❖ In Khoa, out of the total 363 samples tested, only 2.8% (10) samples were collected from organized sector while remaining 97.2% (353) samples were collected from unorganized sector due to non-availability of branded Khoa samples in market. In organized sector, none of the sample was found unsafe, while 50% (5) samples were found substandard (4 samples; 40%) due to the presence of yeast and molds and aerobic plate count above specified levels as well as because of lower than prescribed limit of milk fat (2 samples; 20%). In unorganized sector, out of the 353 samples tested, 2.8% (10) samples were found unsafe due to the presence of *Listeria monocytogenes*, while 60.3% (213) samples were found substandard due to non-compliance on account of chemical quality indicators (91 samples; 25.8%) and microbiological process hygiene criteria (184 samples; 52.1%).
- ❖ In Khoa-based desserts, out of the total 1256 samples tested, 11.3% (142) samples were collected from organized sector and 88.7% (1114) samples were collected from the unorganized sector. In organized sector, none of the sample was found unsafe, while 4.2% (6) samples were found substandard due to presence of microbial hygiene indicators (6 samples; 4.2%) above permitted levels. In unorganized sector, around 0.53% (6) samples were found unsafe on account of presence of *Listeria* and *Salmonella* while 29.8% (332) samples were found substandard i.e. 331 samples (29.7%) in process hygiene parameters and 2 samples (0.2%) in chemical quality parameters.
- ❖ In Chhena-based desserts, out of the total 596 samples tested, 25.7% (153) samples were from organized sector and 74.3% (443) samples were from unorganized sector. In organized sector, all the samples were compliant with safety indicators while 13.7% (21) samples of the organized sector were found non-compliant on account of process hygiene indicators (21 samples; 13.7%) However, in the unorganized sector, 2.3% (10) samples were found microbial safety indicators 31.6% (140) samples from the unorganized sector were found to be non-compliant mainly on account of process hygiene indicators (140 samples; 31.6%) followed by microbial safety indicators; 2.3%).
- ❖ Out of the 27 States/UTs from where samples were collected, the most compliant States/UTs in terms of overall compliance to safety parameters were Andaman & Nicobar Islands, Andhra Pradesh, Chandigarh, Daman & Diu and Dadar and Nagar Haveli, Goa, Gujarat, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Telangana and Uttarakhand (each having 100% compliance), while the least compliant States/UTs was Sikkim (84.2%) preceded by Bihar (89.2%), Rajasthan (90%), Manipur (96.2%); and Punjab (97.1%).

- ❖ The top five compliant States/UTs having lesser number of substandard samples under process hygiene criteria were Manipur (7.5%) followed by Telangana (18%), Himachal Pradesh (20%), Meghalaya (22.5%) and Uttarakhand (25.4%) while the least compliant States/ UTs were Andaman and Nicobar Islands (100%) preceded by Daman & Diu and Goa (each had 60%), Punjab (52.4%), Madhya Pradesh (52.2%) and Jharkhand (50%). Further, the top five compliant States/UTs having lesser number of substandard samples under chemical quality criteria were Manipur, Sikkim, Dadra & Nagar Haveli and Chandigarh (each at 0%) followed by Andhra Pradesh (1.4%), Himachal Pradesh (2.2%), Meghalaya (2.5%) and Chhattisgarh (3.1%) while the least compliant States/ UTs were Andaman and Nicobar Islands (100%) preceded by Daman & Diu (30%), Madhya Pradesh (18.8%), Gujarat (18.7%) and Tamil Nadu (17.1%).
- ❖ Out of the 27 States/ UTs from where samples were collected, the top five compliant States/UTs in terms of overall compliance to quality parameters (comprising of chemical quality and microbiological process hygiene parameters) were Manipur (92%) followed by Telangana (81%), Himachal Pradesh (78%) and Meghalaya (78%), Karnataka (72%) while Andaman and Nicobar Islands recorded the least compliance (0%) followed by Goa, Daman and Diu (30% each), Madhya Pradesh (37%) and Punjab (46%).

### 1. INTRODUCTION AND OBJECTIVES

Milk is the base ingredient for preparation of the majority of the sweets consumed by Indian population. Due to high demand and consumption of sweets especially during festive season, it is important to undertake such surveillance study to ensure quality and safety of milk and milk products. Accordingly, Food Safety and Standards Authority of India (FSSAI) had earlier conducted three nationwide surveys on milk safety and quality, with the last one being held in 2018<sup>(1)</sup>.

In 2019, FSSAI had conducted a pilot survey of milk products to ascertain the quality and safety of milk products sold in and around Delhi during 15<sup>th</sup> October to 7<sup>th</sup> November 2019 coinciding with the festival season. Samples were drawn from 11 districts in multiple locations across Delhi-NCR. During the survey, a total of 1041 samples (438 packed and 603 loose milk products) including Khoa (133), Paneer (409), Ghee (308) and milk-based sweets, such as Khoa Burfi (82) Chhena (20) and Chhena-Rasgulla (89) were collected and tested at National Food Laboratory, Ghaziabad.

The Milk Product Survey 2019 in Delhi revealed that samples were found to have predominantly quality and hygiene related issues<sup>(2)</sup>. Therefore, FSSAI decided to conduct a National level “Milk Product Survey 2020” to assess the quality and safety of milk products sold across the country during the festival period when the demand of such products is high. This will help to understand the ground realities and to check the compliance levels of milk products available in the Indian market as per FSSR 2011.

#### **Objectives**

- To assess the quality and safety of milk products including milk-based desserts sold during festival period in the country
- To identify hotspots for production and sale of adulterated and contaminated milk products
- To put in place a continuous surveillance framework for assessing the quality of milk products sold in the country
- To devise corrective actions/ strategies based on the results of the study and suggest the way forward

### 2. METHODOLOGY

#### 2.1. SCOPE, COVERAGE AND PERIOD

The scope of the study was to conduct a survey of milk products being sold in the Indian market during festival period, when the risk of adulteration and contamination was high due to increased consumption and demand. In order to engage a competent independent third-party agency to undertake this nation-wide survey, FSSAI sought quotations from NABL accredited and FSSAI notified food testing laboratories and the study was awarded to National Collateral Management Services Limited (NCML). The milk product samples collected in this survey were tested at selected analytical laboratories of NCML to assess conformity to chemical and microbiological parameters

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as per FSSR 2011. Although FSSR doesn't specify standards for milk based desserts, in the current Survey the milk-based dessert samples (1852) were analysed for chemical quality parameters i.e., BR Reading and Titratable acidity for the purpose of data generation and to understand their quality w.r.t. possible adulteration and substandard parameters. The parameters for a particular milk based dessert were chosen in line with its base ingredient. For instance, since Gulab Jamun is a Khoa based dessert, therefore the parameters for Khoa were taken into consideration while customizing the parameters to be analysed for Gulab Jamun. The list of parameters tested for each product category are available at Annexure-I. A total of 720 districts across 27 States/UTs and five metro cities (Delhi, Mumbai, Bangalore, Chennai and Kolkata) were identified by FSSAI for sample collection which also included far-flung regions of North-Eastern States. The samples of milk products viz. Mawa/Khoa and its desserts (like Burfi, Pedas, Pindi, Milk Cake, Gulab Jamun, Gujiya, Kala Jamun, etc.), Paneer and Chhena and their desserts (like Rasgulla, Chhenapoda, Chamcham etc.) were collected by the State/UTs FSOs and transported under cold chain conditions (<4 °C) to the specified NCML laboratory for subsequent analysis as per the FSSAI guidelines.

PAN-India sample collection took place during 12<sup>th</sup> and 13<sup>th</sup> November 2020 (before Diwali Festival). However, due to logistic constraints, few samples were collected on a later date also.

### **2.2. SAMPLING**

Guidelines were issued by FSSAI for collection, coding, transportation and analysis of the samples. Standard Operating Procedure (SOP) with clearly defined responsibilities for the State Food Safety Officers (FSOs), Designated Officers (DO) and the laboratory personnel was laid down. FSSAI organized a webinar on November 09, 2020 for FSOs to provide orientation on sampling procedures that are to be followed during survey and clearing their doubts, if any.

In the SOP, a total of 720 districts across 27 States/UTs and five metro cities (Delhi, Mumbai, Bangalore, Chennai and Kolkata) were identified by FSSAI for sample collection. It was mandatory to collect minimum 5 samples from each district and 30 samples from each identified metro cities. Samples of milk products were required to be collected randomly from local markets, retail sweetshops etc., giving the freedom of choice to the FSOs. However, due to certain limitations (predominantly being Covid-19 Pandemic) only 3045 samples were collected across the country out of the total 3750 planned samples. The actual number and percentage of samples collected in each State/UTs out of total mandatory samples as specified in SOP are shown in Figure 1A.

During sampling, sample details were captured "live" by using a customized Android and iOS-based mobile app, "HooperPro". A screen shot of the sample registration process and the number of samples collected at a given time using the HooperPro app are shown in Annexure-II. The app was used to capture details such as: -

- Sampling location;
- Type of product collected;
- Date and time of sampling
- Details of the person performing sampling.

## **FSSAI MILK PRODUCT SURVEY- 2020**

The total number of samples analysed in this survey were 2801 of which 510 samples were of Paneer, 363 samples of Khoa, 76 samples of Chhena, 1256 samples of Khoa-based desserts and 596 samples of Chhena-based desserts (Figure 1B). Out of total 2801 samples analysed, 433 samples (15.4%) were from the organized sector, while the remaining 2368 (84.5%) samples were picked from the unorganized sector. The compliance status of both organized and unorganized sector is given in section 3.4 of this report. Out of the identified 720 districts and 5 metro cities, samples were collected from 542 districts and 3 metro cities respectively. Delhi and Kolkata did not participate in the survey out of the five identified metro cities. The number of samples collected (district and metro city wise) for each product is given at Annexure–III. The total number of samples collected for each product across each States/UTs is given at Annexure–IV.

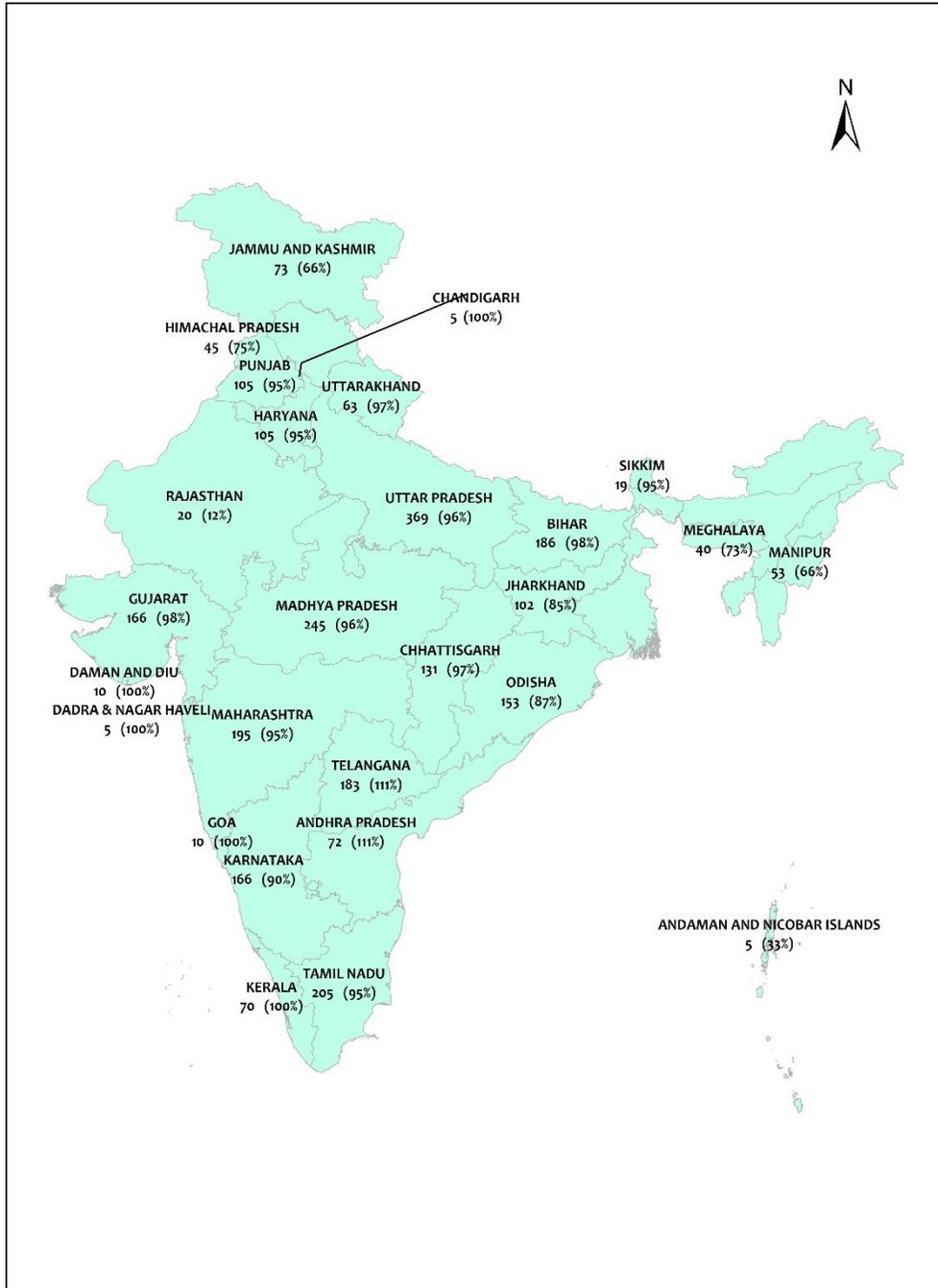


Figure 1A. Graphical representation of the State/UT-wise number of samples collected (% of mandated samples)

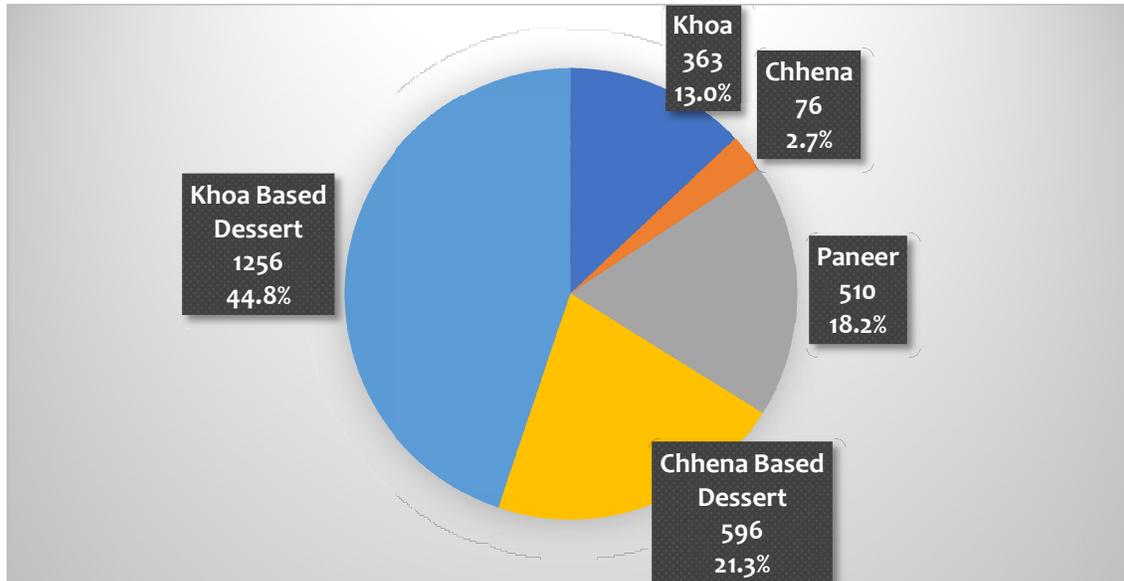


Figure 1B. Product-wise distribution of 2801 samples

All samples of milk products collected by FSOs were further transported under cold chain conditions (<4 °C) to the laboratory along with “Test Request Form” (Annexure-V). The containers provided to various states under Sample Management System (SMS) as well as the refrigerators provided in Food Safety on Wheels (FSW) were used for transportation of samples, wherever available. The total number of samples sent from all States/UTs to each lab is given in Figure 1C.

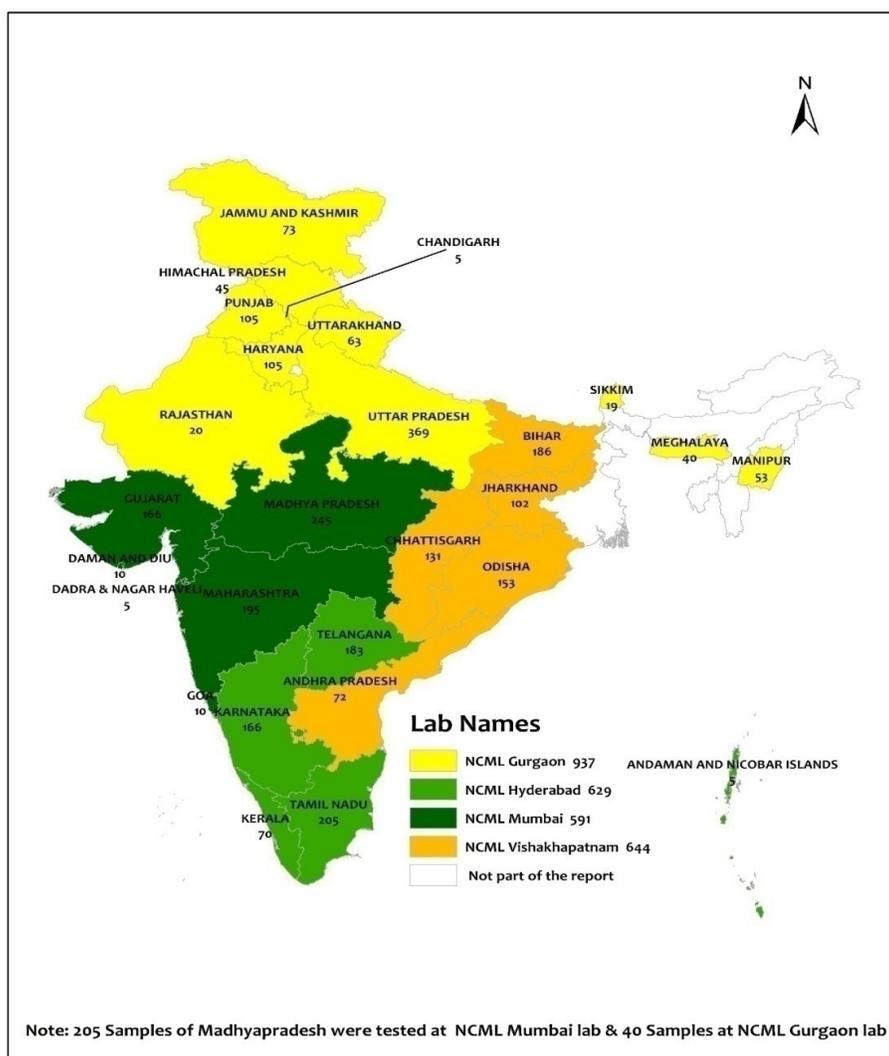


Figure 1C. Graphical representation of the number of samples collected & analyzed (state wise and lab wise)

**Note-1:** - There were 245 samples collected from Madhya Pradesh, out of those 205 samples were tested at NCML Mumbai lab and 40 samples were tested at NCML Gurgaon lab.

**Note-2:** - Data of 238 samples from SPHL Assam (46) and WBPHL (192) could not be considered for compilation of results as samples were not completely analyzed/ reported. 6 samples were not analyzed as they crossed their shelf life on the date of analysis.

**Note-3:** - The total number of samples picked for the survey was 2801, which also included 91 samples taken from 3 metro cities (Mumbai, Chennai and Bengaluru) [Annexure – III].

### **2.3. SAMPLE ANALYSIS**

On receipt of the samples at the designated lab, appropriate storage conditions were maintained till the time of analysis. Samples were analyzed for the chemical and microbiological parameters as per Food Safety and Standards Regulation (FSSR) 2011(Annexure-I). In addition to FSSR requirements, the milk-based desserts samples (1852) were also analysed for chemical quality parameters i.e., BR Reading and Titratable acidity for data generation and to understand its quality with respect to possible adulteration and substandard quality. The analysis was not carried out for the products not covered by this survey (such as milk powder, ghee, curd, tofu, etc.). However, the details of such samples are listed in Annexure-VI for information.

All the samples received at NCML Laboratories were examined and the samples which were found fit for analyses were analyzed by trained analysts using standard/validated methods to ensure consistency in analytical results across all laboratories. Analysis involved a wide range of instrumentation, such as LC-MS/MS, GC-MS/MS and ICP-MS, GC, HPLC apart from classical chemical and microbial analytical techniques.

### **2.4. LIMITATIONS OF THE SURVEY**

The FSOs involved in the Survey extended all necessary cooperation, however there were certain challenges faced during the sample collection and transportation due to the extent of the operation and the nature of the samples collected. The major challenges faced are summarized below:

- The availability of FSOs at certain locations on desired dates was a challenge as some of the FSOs contracted Covid-19 during the survey.
- Challenges were encountered while transporting samples from Jammu & Kashmir where the vehicles were stopped by authorities due to inclement weather conditions. Due to delay in transit, some of the samples received were in unfit condition for microbiological analysis.

**RESULTS AND DISCUSSION****3.1. GEOGRAPHICAL STUDY OF SAMPLES ANALYSED (STATE/UT, DISTRICT RANKING BASED ON COMPLIANCE)**

On completion of sample analysis, data was compiled to evaluate the compliance of the samples at State/UT level. Out of the total 2801 samples tested, 433 samples were drawn from the organized sector while 2368 samples were drawn from the unorganized sector. Overall, 59.5% (1668) were compliant while the remaining 40.4% (1133) were non-compliant with the requirements under FSSR, 2011 on either one or more parameters which are discussed subsequently under different heads. Results indicate that, out of the 27 States/UTs from where samples were collected, the most compliant States/UTs in terms of overall compliance to safety parameters were Andaman & Nicobar Islands, Andhra Pradesh, Chandigarh, Daman & Diu and Dadar and Nagar Haveli, Goa, Gujarat, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Telangana and Uttarakhand (each having 100% compliance), while the least compliant States/UTs was Sikkim (84.2%) preceded by Bihar (89.2%), Rajasthan (90%), Manipur (96.2%); and Punjab (97.1%).

The top five compliant States/UTs having lesser number of substandard samples under process hygiene criteria were Manipur (7.5%) followed by Telangana (18%), Himachal Pradesh (20%), Meghalaya (22.5%) and Uttarakhand (25.4%) while the least compliant States/ UTs were Andaman and Nicobar Islands (100%) preceded by Daman & Diu and Goa (each had 60%), Punjab (52.4%), Madhya Pradesh (52.2%) and Jharkhand (50%). Further, the top five compliant States/UTs having lesser number of substandard samples under chemical quality criteria were Manipur, Sikkim, Dadra & Nagar Haveli and Chandigarh (each at 0%) followed by Andhra Pradesh (1.4%), Himachal Pradesh (2.2%) , Meghalaya (2.5%) and Chhattisgarh (3.1%) while the least compliant States/ UTs were Andaman and Nicobar Islands (100%) preceded by Daman & Diu (30%), Madhya Pradesh (18.8%), Gujarat (18.7%) and Tamil Nadu (17.1%).

Further, out of the 27 States/ UTs from where samples were collected, the top five compliant States/UTs in terms of overall compliance to quality parameters (comprising of chemical quality and microbiological process hygiene parameters) were Manipur (92%) followed by Telangana (81%), Himachal Pradesh (78%) and Meghalaya (78%), Karnataka (72%) while Andaman and Nicobar Islands recorded the least compliance (0%) followed by Goa, Daman and Diu (30% each), Madhya Pradesh (37%) and Punjab (46%).

Overall, State/UT-wise ranking with respect to compliance considering both safety and substandard/ quality aspects) is shown in Table 1A, while Table 1B and Table 1C give State/UT-wise ranking with respect to safety and substandard/ quality aspects, respectively.

Table 1A: State/ UT-wise ranking with respect to overall compliance

S. No.	State / UT	No. of Samples	Compliance %	Non-compliance %	Rank for Compliance %
1	MANIPUR	53	92%	8%	1
2	TELANGANA	183	81%	19%	2
3	HIMACHAL PRADESH	45	78%	22%	3
4	MEGHALAYA	40	78%	23%	4
5	KARNATAKA	166	72%	28%	5
6	KERALA	70	71%	29%	6
7	UTTARAKHAND	63	71%	29%	6
8	ANDHRA PRADESH	72	69%	31%	7
9	SIKKIM	19	68%	32%	8
10	JAMMU AND KASHMIR	73	66%	34%	9
11	CHHATTISGARH	131	66%	34%	10
12	TAMIL NADU	205	64%	36%	11
13	HARYANA	105	61%	39%	12
14	CHANDIGARH	5	60%	40%	13
15	DADRA & NAGAR HAVELI	5	60%	40%	13
16	ODISHA	153	57%	43%	14
17	UTTAR PRADESH	369	56%	44%	15
18	BIHAR	186	56%	44%	16
19	MAHARASHTRA	195	53%	47%	17
20	GUJARAT	166	52%	48%	18
21	JHARKHAND	102	50%	50%	19
22	RAJASTHAN	20	50%	50%	19
23	PUNJAB	105	45%	55%	20
24	MADHYA PRADESH	245	36%	64%	21
25	DAMAN AND DIU	10	30%	70%	22
26	GOA	10	30%	70%	22
27	ANDAMAN AND NICOBAR ISLANDS	5	0%	100%	23
-	<b>Grand Total</b>	<b>2801</b>	<b>60%</b>	<b>40%</b>	<b>--</b>

\*Based on pass%; 1st rank is assigned to state with maximum pass%; if there is same pass percentage then state/ UT with higher number of samples is given higher rank.

Table 1B: State/ UT-wise compliance data and their ranking based on safety parameters

S.	State/ UT	No. of	No. of	% of Unsafe	Ranking
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## FSSAI MILK PRODUCT SURVEY- 2020



No.		samples	Unsafe samples	samples	(based on % Pass)
1	KARNATAKA	166	0	0.0%	1
2	ANDAMAN AND NICOBAR ISLANDS	5	0	0.0%	1
3	KERALA	70	0	0.0%	1
4	ANDHRA PRADESH	72	0	0.0%	1
5	CHANDIGARH	5	0	0.0%	1
6	JHARKHAND	102	0	0.0%	1
7	UTTARAKHAND	63	0	0.0%	1
8	DAMAN AND DIU	10	0	0.0%	1
9	DADRA & NAGAR HAVELI	5	0	0.0%	1
10	GUJARAT	166	0	0.0%	1
11	MADHYA PRADESH	245	0	0.0%	1
12	GOA	10	0	0.0%	1
13	MAHARASHTRA	195	0	0.0%	1
14	TELANGANA	183	0	0.0%	1
15	TAMIL NADU	205	1	0.5%	2
16	CHHATTISGARH	131	1	0.8%	3
17	ODISHA	153	2	1.3%	4
18	JAMMU AND KASHMIR	73	1	1.4%	5
19	UTTAR PRADESH	369	6	1.6%	6
20	HARYANA	105	2	1.9%	7
21	HIMACHAL PRADESH	45	1	2.2%	8
22	MEGHALAYA	40	1	2.5%	9
23	PUNJAB	105	3	2.9%	10
24	MANIPUR	53	2	3.8%	11
25	RAJASTHAN	20	2	10.0%	12
26	BIHAR	186	22	11.8%	13
27	SIKKIM	19	3	15.8%	14
	<b>Grand Total</b>	<b>2801</b>	<b>47</b>	<b>1.7%</b>	

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Table 1C: State/ UT-wise compliance data and their ranking based on quality parameters

S.No.	State/ UT	No. of samples	No. of substandard samples	% of Substandard samples	Ranking (based on % Pass)
1	MANIPUR	53	4	7.5%	1
2	TELANGANA	183	35	19.1%	2
3	HIMACHAL PRADESH	45	10	22.2%	3
4	MEGHALAYA	40	9	22.5%	4
5	KARNATAKA	166	47	28.3%	5
6	UTTARAKHAND	63	18	28.6%	6
7	KERALA	70	20	28.6%	6
8	ANDHRA PRADESH	72	22	30.6%	7
9	SIKKIM	19	6	31.6%	8
10	JAMMU AND KASHMIR	73	25	34.2%	9
11	CHHATTISGARH	131	45	34.4%	10
12	TAMIL NADU	205	73	35.6%	11
13	HARYANA	105	41	39.0%	12
14	DADRA & NAGAR HAVELI	5	2	40.0%	13
15	CHANDIGARH	5	2	40.0%	13
16	ODISHA	153	66	43.1%	14
17	UTTAR PRADESH	369	160	43.4%	15
18	BIHAR	186	82	44.1%	16
19	MAHARASHTRA	195	91	46.7%	17
20	GUJARAT	166	80	48.2%	18
21	JHARKHAND	102	51	50.0%	19
22	RAJASTHAN	20	10	50.0%	19
23	PUNJAB	105	57	54.3%	20
24	MADHYA PRADESH	245	156	63.7%	21
25	GOA	10	7	70.0%	22
26	DAMAN AND DIU	10	7	70.0%	22
27	ANDAMAN AND NICOBAR ISLANDS	5	5	100.0%	23
	<b>Grand Total</b>	<b>2801</b>	<b>1131</b>	<b>40.4%</b>	

At the district level, out of the 542 districts from where samples were collected, only 16% of districts showed compliance with all the parameters as per FSSR, while no sample was compliant in 5% of the districts. Table1D represents the number and percentage of districts showing the specific level of compliance.

Table 1D: Compliance level wise number of Districts

COMPLIANCE LEVEL (% OF SAMPLES PASSED IN A DISTRICT)	NUMBER OF DISTRICTS IN CATEGORY	% SHARE
100%	87	16%
>=75 to <100%	113	21%
>=50 to <75%	142	26%
>=25 to <50%	119	22%
>0 to <25%	56	10%
0%	25	5%
Grand Total	542	--

**3.2. PRODUCT WISE STUDY OF NON-COMPLIANT SAMPLES**

The data was evaluated to determine compliance levels of different products against requirements specified under FSSR, 2011. Maximum percentage of non-compliance was observed in Paneer followed by Khoa, Chhena and Khoa/Chhena based Desserts (Figs: 2A & 2B). Results indicate that value addition to convert raw materials into desserts which involve further processing such as heating, sugar addition etc., increased the compliance levels mainly in microbiological parameters.

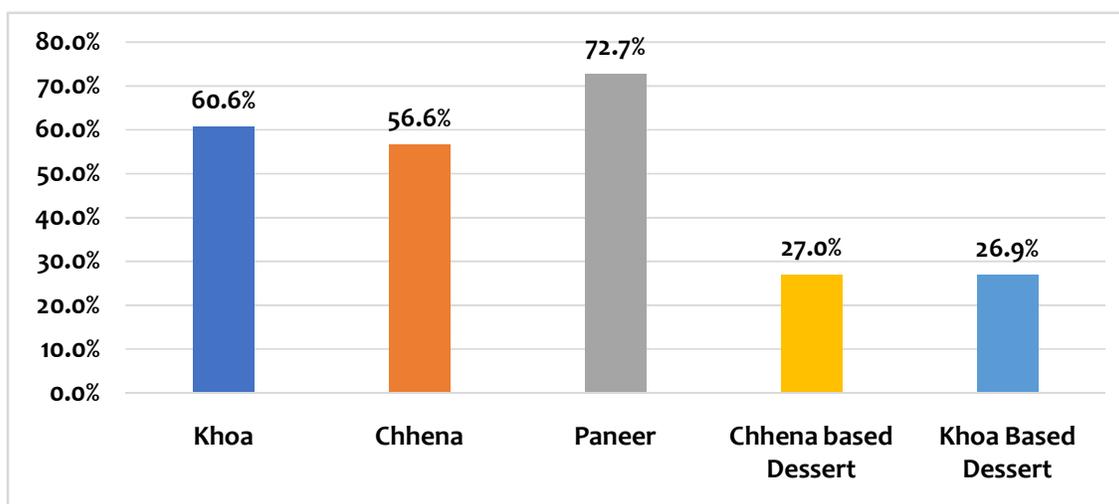


Figure 2A. Product-wise percentages of non-compliant samples

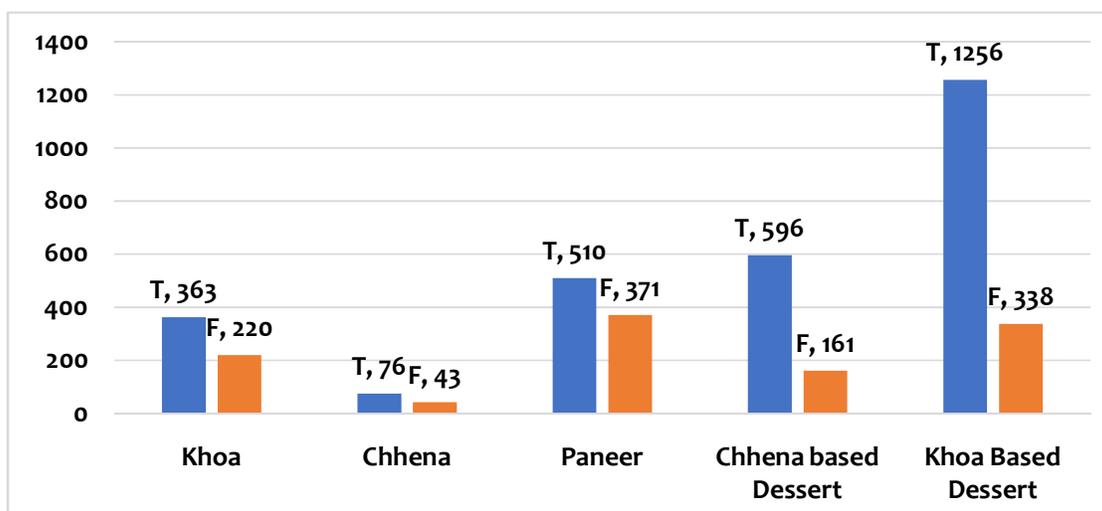


Figure 2B. Product wise number of non-compliant samples  
 T=Total number of samples analyzed; F = number of non-compliant samples

The compliance levels of different products across States/UTs are given at Annexure-VIII. The product wise compliance of States/UTs is given below:

- In Chhena, all the 76 samples collected belonged to the unorganized sector. Out of these, 43.4% (33) samples were compliant and 56.6% (43) samples were non-compliant. Out of the 43 non-compliant samples, 43 were substandard on account of process hygiene indicators (37 samples) followed by chemical quality indicators (11 samples) and 2 samples were found unsafe with respect to microbial safety indicators. Further, in process hygiene criteria, non-compliance was observed on account of yeast and molds count (34 samples) while in chemical quality indicators, maximum samples were found non-compliant for milk fat (10 samples). The overall details of Chhena samples are given at Fig. 2C.
- Further, in States/UTs from where Chhena samples were collected, maximum compliance was observed in Chhattisgarh and Odisha, while Andaman and Nicobar Islands and Maharashtra showed the least compliance.

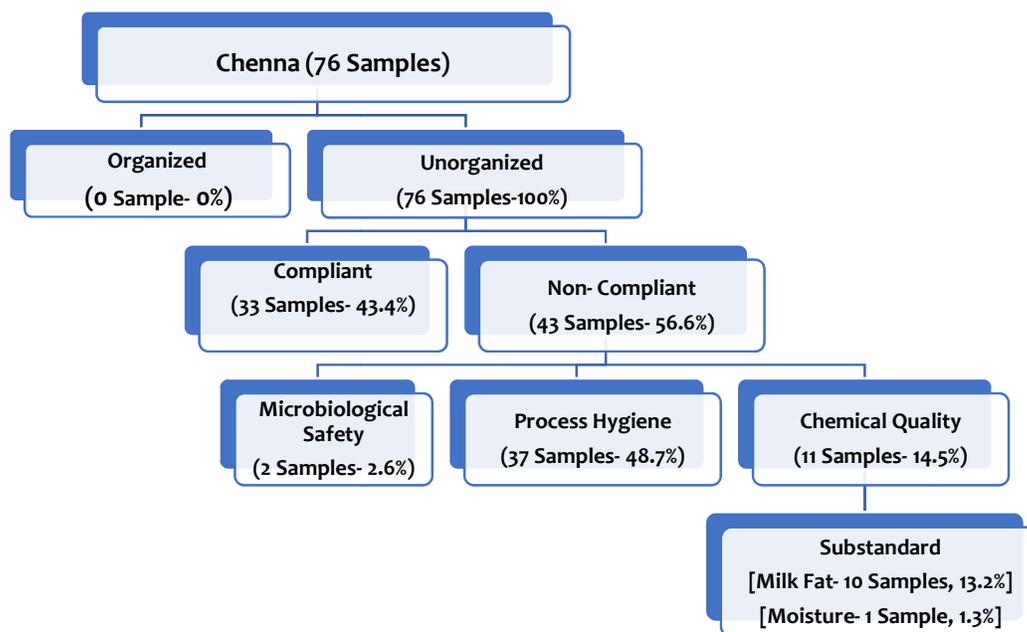


Fig 2C: Distribution of Chhena samples based on compliance in organized and unorganized sector.

- In Paneer, 25.1% (128) samples were collected from the organized sector while 74.9% (382) samples were collected from unorganized sector making it to a total of 510 samples of Paneer collected and analyzed in this survey. Out of these, 62.5% (80) samples from organized sector and 76.2% (291) samples from unorganized sector were found non-compliant. The major non-compliance in both organized and unorganized sectors was attributed to process hygiene indicators followed by chemical quality indicators. None of the samples from organized sector was found non-compliant on account of microbial safety indicators. Among process hygiene indicators, the major non-compliance in organized sector (61.7%) and unorganized sector (63.4%) was found due to presence of yeast and molds and aerobic plate count above permitted levels. Among chemical quality indicators, major non-compliance in organized sector (10.9%) and in unorganized sector (36.9%) was due to presence of milk fat below the minimum permitted limits as per FSSR, 2011, rendering the sample substandard. The overall details of Paneer samples are given at Fig. 2D.
- Further, in States/UTs from where Paneer samples were collected, the maximum compliance was observed in Chandigarh and Meghalaya showed while all tested samples found non-compliant from the States/UTs of Andaman and Nicobar Islands, Goa, Dadra and Nagar Haveli, Daman and Diu, Rajasthan and Telangana.

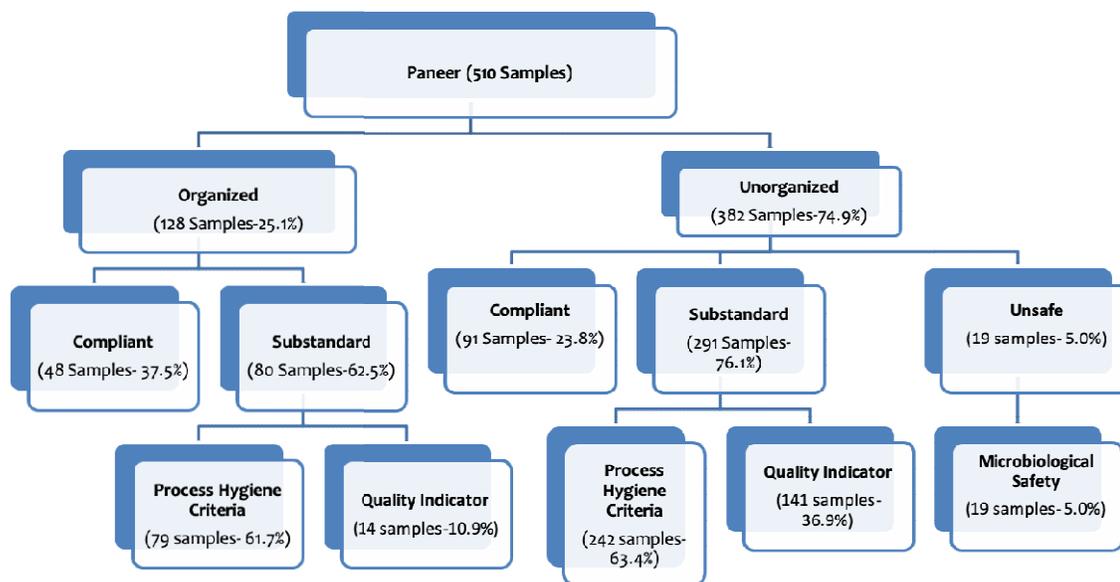


Fig 2D: Distribution of compliant and non-compliant Paneer samples in organized and unorganized sector.

- In Khoa, out of the total 363 samples analysed, only 2.8% (10) samples were collected from organized sector while 97.2%(353) samples were collected from unorganized sector due to non-availability of Khoa in organized market. In organized sector, out of a total of 5 non-compliant samples, 40% (4) samples were found non-compliant mainly due to presence of yeast and molds and aerobic plate count above permitted levels. None of the samples drawn from organized sector was found adulterated with added starch, foreign fat. Similarly, presence of microbial pathogens and chemical contaminants such as heavy metals, pesticide residues etc. was also not found in organized sector samples. In unorganized sector, 52.1%(184) samples were found non-compliant on account of process hygiene indicators and 25.8% (91) samples were found non-compliant on account of chemical quality indicators while the presence of microbial pathogens (*Listeria monocytogenes*) was confined to 2.8%(10) samples only.
- Similar to the organized sector, major non-compliance in Khoa samples drawn from unorganized sector was due to the presence of yeast and molds and aerobic plate count above permitted levels. In chemical quality, adulteration with foreign fat in 7.1% (25) samples and milk fat below minimum permitted levels in 18.1%(64) samples were major contributors to non-compliance. The overall details of Khoa samples are given at Fig. 2E.
- Further, in States/UTs from where Khoa samples were collected, maximum compliance was observed in Kerala and Manipur while Andaman and Nicobar Islands and Meghalaya were found to be the most non-compliant States/UTs.

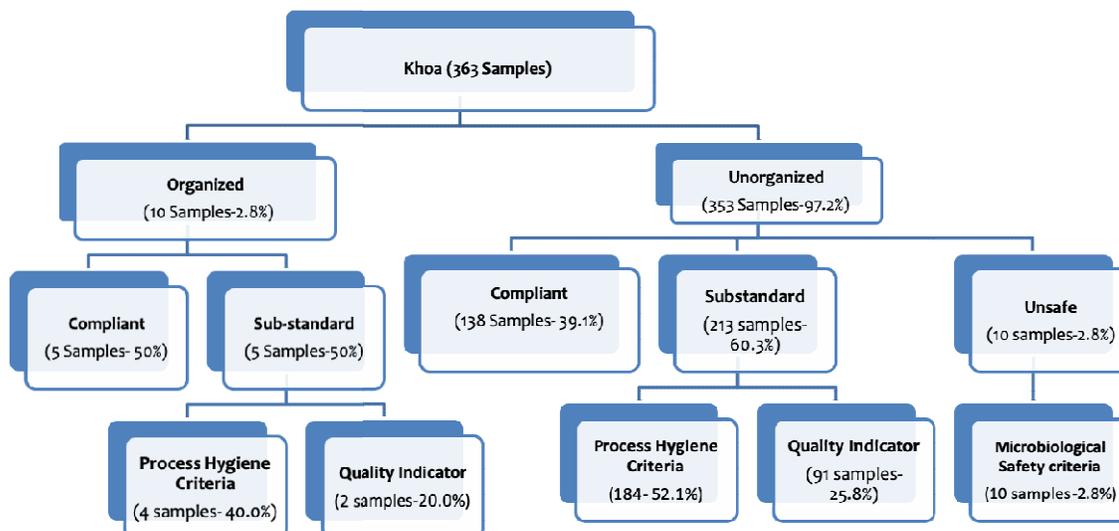


Fig 2E: Distribution of compliant and non-compliant Khoa samples in organized and unorganized sector.

- In Khoa based desserts, a total of 1256 samples were collected, out of which 11.3% (142) were from the organized sector and 88.7% (1114) samples were from the unorganized sector. In organized sector, only 4.2%(6) samples were found non-compliant on account of process hygiene indicators, while none of the samples was non-compliant in microbial safety indicators and chemical quality and safety indicators. Similarly, in unorganized sector, the non-compliance was mainly found on account of process hygiene indicators (29.7% i.e., 331 samples), microbial safety indicators (0.5% i.e., 6 samples) followed by chemical quality indicators (0.2% i.e., 2 samples). However, none of the unorganized sector samples was found non-compliant for chemical safety. The overall details of Khoa based dessert samples are given at Fig. 2F.
- Further, in States/UTs from where Khoa based dessert samples were collected, the maximum compliance was observed in Manipur, Himachal Pradesh and Tamil Nadu while Chandigarh, Goa and Daman & Diu recorded the least compliance.

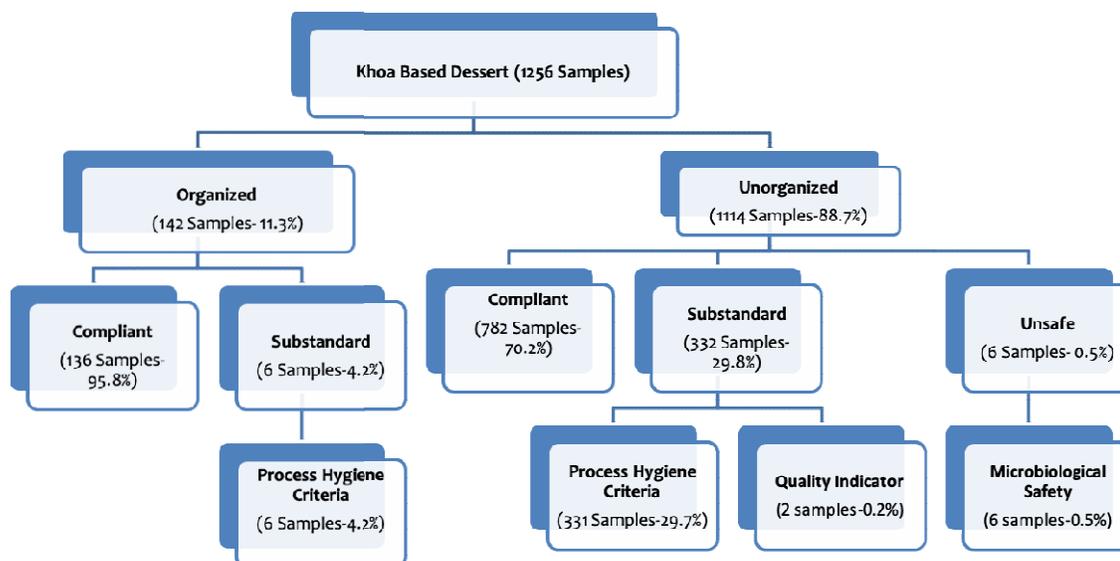


Fig 2F: Distribution of Compliant and Non-Compliant Khoa based dessert samples in organized and unorganized sector.

- In Chhena based dessert, total 596 samples were collected and analysed, out of which 25.7% (153) samples were from organized sector and 74.3% (443) samples were from the unorganized sector. In organized sector, 13.7% (21) samples were found non-compliant on account of process hygiene indicators while none of the samples was non-compliant for microbial safety indicators and chemical quality and safety indicators. Similarly, in unorganized sector, the non-compliance was mainly found on account of process hygiene indicators (31.6% i.e., 140 samples) followed by microbial safety indicators (2.3% i.e., 10 samples). However, none of the unorganized sector samples was found non-compliant for chemical quality and safety indicators. The overall details of Chhena based dessert samples are given at Fig. 2G.

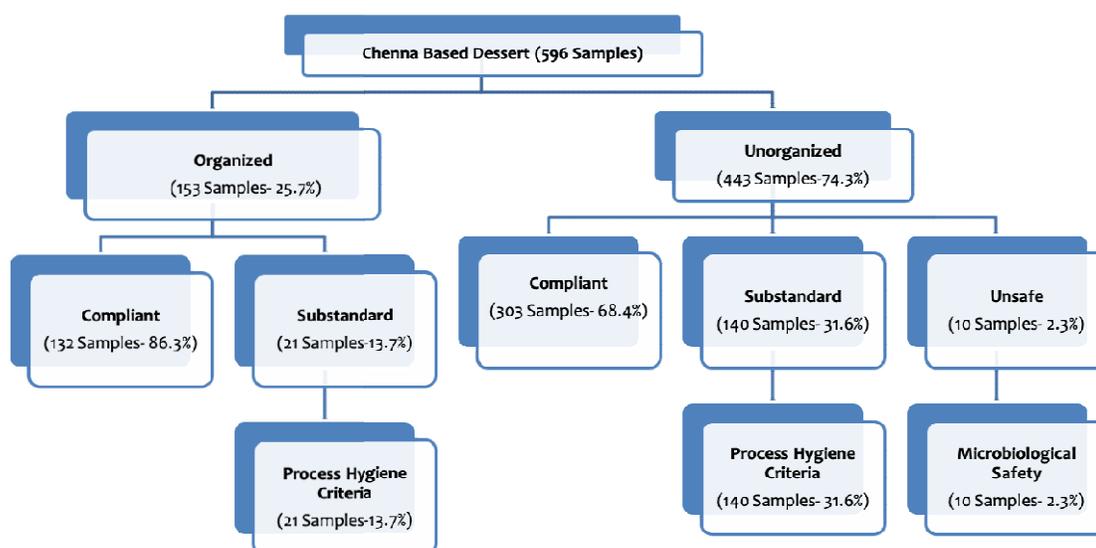


Fig 2G: Distribution of compliant and Non-compliant Chhena based dessert samples in organized and unorganized sector.

- Further, in States/UTs from where Chhena based dessert samples were collected, in all States compliance level of more than 50% was observed, out of which Chandigarh, Dadra and Nagar Haveli, Daman and Diu, Kerala, Manipur and Rajasthan showed 100% compliance. However, Compliance level was least i.e., 31.4% in Madhya Pradesh.

**3.3. PARAMETER WISE STUDY OF NON-COMPLIANT SAMPLES**

The milk product samples were analysed for two categories of parameters i.e., chemical and microbiological. The Chemical group was further divided into safety and quality (adulteration and sub-standard) indicators. Similarly, the analysis of microbiological group was sub-divided into safety and hygiene indicators. The figures (1 to 3) given in Annexure-IX illustrate parameters that were considered for analysis of milk products taken in this survey under chemical and microbiological group. The total number of non-compliant samples under different test parameter groups is shown in Table-2. Further, the classification of product wise non-compliant samples into each parameter group is given in Annexure-X. The parameter wise data of non-compliant samples from each States/UTs for various milk products are given at (Annexure-XII to XXV). The abbreviations used in Annexure-XII to XXV are listed in Annexure-XI.

Table2. Test parameter group-wise total number of non-compliant samples

S No	Product Name	Total Sample Number	Organized/ Unorganized	Sample, Number	Over all NC*	Chemical NC		Microbiological NC	
						Quality	Hygiene	Safety	
1	Chhena	76	Organized	0	0	0	0	0	
			Unorganized	76	43	11	37	2	
2	Khoa	363	Organized	10	5	2	4	0	
			Unorganized	353	215	91	184	10	
3	Paneer	510	Organized	128	80	14	79	0	
			Unorganized	382	291	141	242	19	
4	Chhena based Dessert	596	Organized	153	21	0	21	0	
			Unorganized	443	140	0	140	10	
5	Khoa Based Dessert	1256	Organized	142	6	0	6	0	
			Unorganized	1114	332	2	331	6	
Total			Organized	433	112	16	110	0	
			Unorganized	2368	1021	245	934	47	
			Grand Total	2801	1133	261	1044	47	

\*The sum total of overall NC against the milk product may vary with respect to subsequent individual chemical and microbiology NC which is indicative of the repetition of the same sample due to its non-compliance in one or more parameters.

### 3.3.1. PRODUCT SAFETY INDICATORS

#### 3.3.1.1. MICROBIOLOGICAL SAFETY INDICATORS:

All 2801 samples of milk products were analysed for food borne pathogens, *Listeria monocytogenes* and *Salmonella spp.* as per Appendix B of FSS (Food Product Standards and Food Additives) Regulations, 2011. Combining both the pathogens, a total of 1.7% (47) samples (1.7%) of milk products were found non-compliant for microbiological safety indicators. Incidents of presence of *Listeria* (in more than 1.2% samples) were more profound than that of *Salmonella* (0.5% samples). Figures 4A and 4B summarize and demonstrate the product-wise and state-wise detection of both pathogens.

#### A. *Listeria monocytogenes*

- 34 samples (1.2%) out of 2801 samples collected from 27 States/UTs were found to be contaminated with *Listeria monocytogenes*. Maximum non-compliance was observed in Khoa, followed by Paneer, Chhena, Chhena-based desserts and Khoa-based desserts.
- Contamination with *L. monocytogenes* was observed in majority of samples from Sikkim followed by Rajasthan and Bihar.
- In Sikkim, 19 samples were analysed, out of which 3(15.8%) samples were contaminated with *Listeria monocytogenes* and all 3 samples were dessert samples. In Rajasthan, a total of 20 samples were analysed, out of which 2(10%) samples were contaminated with *Listeria monocytogenes* and both samples were Khoa samples. In Bihar, 186 samples were analysed, out of which 17(9.1%) samples were contaminated with *Listeria monocytogenes*, of which 2 are Khoa samples, 1 is Chhena sample, 9 are Paneer samples and 5 are dessert samples.
- Other hotspots for contamination with *Listeria monocytogenes* are Manipur with 3.8% non-compliance in Paneer and Khoa based dessert samples followed by Meghalaya with 2.5% non-compliance in Chhena based desserts.
- No sample from Uttarakhand, Chandigarh, Gujarat, Dadra & Nagar Haveli, Daman & Diu, Maharashtra, Goa, Madhya Pradesh, Chhattisgarh, Jharkhand, Odisha, Andhra Pradesh, Telangana, Karnataka, Kerala, Tamil Nadu and Andaman & Nicobar Islands was found non-compliant for the presence of *L. monocytogenes*. [Refer: Annexure-XII].

#### B. *Salmonella spp.*

- 15 samples (0.53%) out of the total 2801 samples analysed, were found to be contaminated with *Salmonella spp.*
- Maximum non-compliance was reported in Paneer followed by Chhena and milk-based desserts; while *Salmonella* was not detected in any of the Khoa samples.
- In case of Chhena, only one sample collected from Uttar Pradesh was found to be contaminated with *Salmonella spp.*
- In case of Paneer samples, maximum non-compliance was reported in Bihar (13.9%), followed by Punjab (4.3%), Chhattisgarh (3.6%) and Tamil Nadu (2.9%). In case of

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Desserts, maximum sample non-compliance was observed in Bihar (6.3%) followed by Odisha (3.4%), Punjab (2.1%) with respect to samples analysed from respective States/UTs.

- No sample from Andaman & Nicobar Islands, Andhra Pradesh, Chandigarh, Dadra & Nagar Haveli, Daman & Diu, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Rajasthan, Sikkim, Tamil Nadu, Telangana and Uttarakhand were detected positive for the presence of *Salmonella spp*[Refer: Annexure XIII].
- *Listeria monocytogenes* is an omnipresent bacterium causing Listeriosis, a life-threatening infectious disease caused due to the consumption of contaminated food especially milk and milk products (Kasalica *et. al.*, 2011). *Listeria* occurs mostly as a corollary of post-pasteurization contamination since it has the ability to grow at low temperatures and can survive freezing temperatures. Similarly, *Salmonella* is the major cause of bacterial food poisoning in humans across the world (Zhang *et. al.*, 2016; Rahman, 2017). It has been documented that more than 90% of infections caused by *Salmonella* is as a consequence of ingestion of contaminated meat, eggs and milk (Foley and Lynne, 2008).
- More rapid and reliable methods for the detection of *Listeria* and *Salmonella* are required in order to ascertain the presence of these pathogens. Further, it is important to implement adequate preventive measures, identify critical points in the manufacturing processes and follow proper sanitation measures. The most convenient and reliable method to decrease the microbial load as well as to kill pathogens like *Listeria* and *Salmonella* is Pasteurization, which has been proven to improve the safety of milk better than other methods (Currier, 1981).

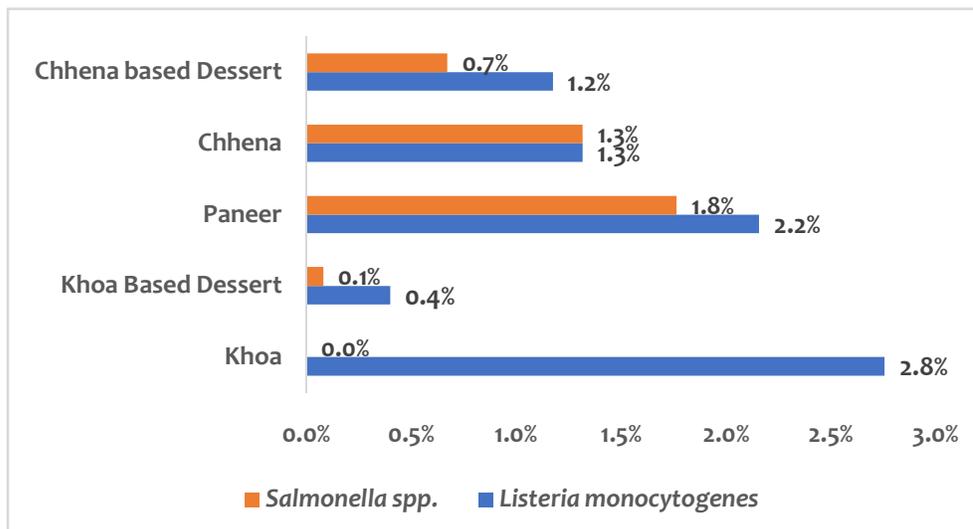


Figure 4A: Product wise % samples which were non-compliant on account of presence of food borne pathogens (*Salmonella spp.* & *Listeria monocytogenes*)

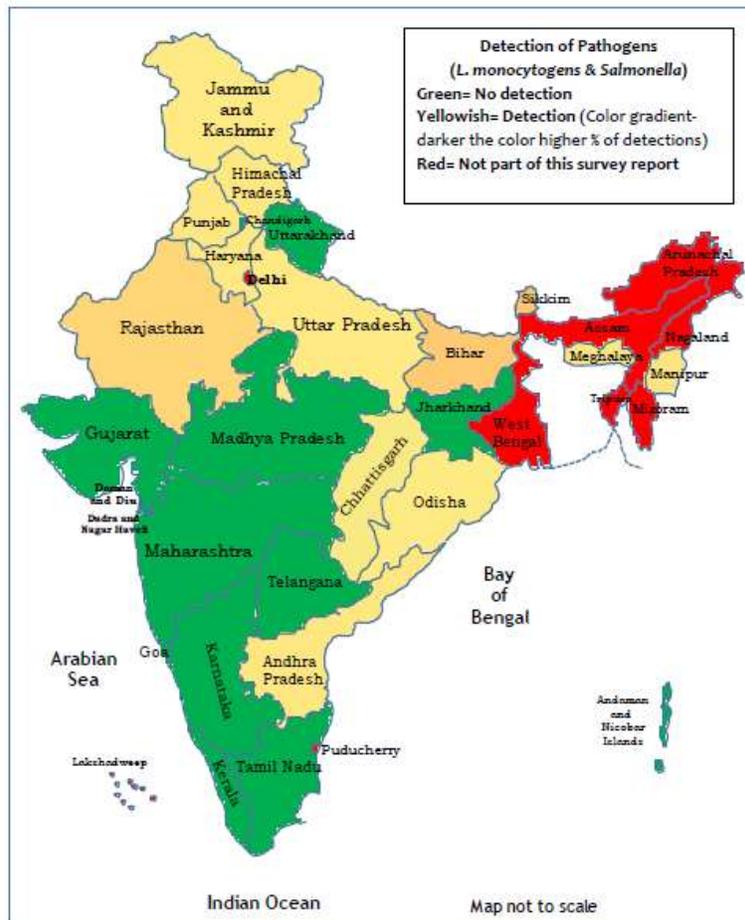


Figure 4B: Detection of food borne pathogens (*Salmonella* & *Listeria monocytogenes*) in States/UTs

**3.3.1.2. CHEMICAL SAFETY INDICATORS:**

- The samples collected were tested for chemical safety indicators such as pesticide residues, heavy metals and melamine as per the FSS (Contaminants, toxins and residues) Regulation, 2011.

- A. PESTICIDE RESIDUES:** All the samples of Khoa (363), Paneer (510) and Chhena (76) were tested for pesticide residues. None of the samples analyzed were found non-compliant for pesticide residues.
- B. HEAVY METALS:** All the samples of Khoa (363), Paneer (510) and Chhena (76) were tested for Heavy Metals such as Lead, Mercury, Arsenic etc. None of the samples analysed were found non-compliant for Heavy Metals.
- C. MELAMINE:** All the samples of Khoa (363), Paneer (510) and Chhena (76) were tested for Melamine. None of the samples analysed were found to contain Melamine above the safe levels i.e., 2.5 ppm prescribed under FSSR.
- **AFLATOXINS:** Aflatoxins (AFM<sub>1</sub>) was detected in 156 (16.4%) of the 949 samples analysed. However, since there is no reference standards specified for AFM<sub>1</sub> in FSSR, no further conclusions have been drawn.
  - From the current survey outcome, it is evident that none of the analysed samples failed in chemical safety indicators viz. pesticide residues, heavy metals and melamine. The obtained values for pesticide residues and melamine were found to be 'Below Limit of Quantification or BLQ' (taken as 0.01 ppm for pesticide residues and 0.05 ppm for melamine). Further, 46% samples of Paneer, 43% samples of Khoa and 54% samples of Chhena detected the presence of heavy metal Copper above BLQ of 0.01 ppm. However, the values obtained were much lower than the maximum permissible limit of 30 ppm specified in FSSR. Similarly, 32% samples of Paneer, 37% samples of Khoa and 46% samples of Chhena detected the presence of heavy metal Lead above BLQ of 0.01 ppm. However, the values obtained were much lower than the maximum permissible limit of 2.5 ppm specified in FSSR.
  - There is plethora of scientific evidences and citations that prove that pesticide residues, heavy metals, melamine etc. are some of the major chemical contaminants present in milk and milk products (Sidawi *et.al.* 2021; Awasthi *et.al.* 2012). The primary sources of contamination are water, cattle feed, sources/materials used during the processing as well as improper handling during pre-and post-processing techniques. However, at the same time, the processes involved in milk processing can be effective in alleviation of these contaminants up to a certain extent.
  - Modifications in milk manufacturing processes such as handling, processing, and storage of milk and milk products; use of only food grade materials etc. have shown to reduce the heavy metal contamination (Chandrakar *et. al.*, 2018). Similarly, thermal treatments like boiling, steaming, canning, drying, dehydration etc. during the manufacturing of milk products have been found to reduce several pesticides through evaporation, co-distillation and/or thermal degradation depending upon the type of pesticide residues and the duration of the treatment (Ciscato *et. al.*, 2018).

### **3.3.2. PROCESS HYGIENE INDICATORS**

In total, 2801 samples were analysed for process hygiene indicators as per Appendix B of Food Safety and Standards (Food Product Standards and Food Additives) Regulations, 2011.

### **A. *Escherichia coli***

- 78 samples (2.8% of 2801 samples) picked from 27 States/UTs were found to be non-compliant for contamination with *Escherichia coli*.
- Maximum non-compliance was observed in Chhena (9.2% which is 7 out of 76 samples), followed by Paneer (8.8% which is 45 out of 510 samples), Khoa (1.4% which is 5 out of 363 samples) and Desserts (1.1% which is 21 out of 1852 samples).
- More than 26% samples were found non-compliant in all types of milk products obtained from Bihar; maximum non-compliance being in Paneer (more than 72%), followed by Chhena (38.9%), Dessert samples (16.0%) and Khoa (4.4%). Other hotspots were Andhra Pradesh with 4.2% non-compliant samples of desserts, followed by Karnataka reported to have non-compliance in more than 23.8% in Paneer samples, Tamil Nadu with 17.1% and 4.3% non-compliant Paneer and Khoa samples respectively. Chhattisgarh reported 10.7% non-compliance in Paneer samples followed by Maharashtra with 6.7% in Paneer samples and 3.7% in Khoa samples and Kerala with 5.6% in Paneer samples.
- None of the samples from Andaman & Nicobar Islands, Chandigarh, Dadra & Nagar Haveli, Daman & Diu, Goa, Haryana, Himachal Pradesh, Jammu And Kashmir, Jharkhand, Manipur, Meghalaya, Punjab, Rajasthan, Sikkim, Telangana, Uttar Pradesh and Uttarakhand were detected positive for *E. coli* [Refer: Annexure- XIV].

### **B. *Staphylococcus aureus***

- 66 samples (2.4% of 2801 samples) were non-compliant on account of the presence of *Staphylococcus aureus*. Maximum percentage of non-compliance was observed in Chhena (7.9% which is 6 out of 76 samples), followed by Paneer (5.1% which is 26 out of 510 samples), Khoa (3.3 which is 12 out of 363 samples), Chhena based dessert (2.5% which is 15 out of 596 samples) and Khoa based dessert (0.6% which is 7 out of 1256 samples) of the samples tested for each product category.
- In Bihar, more than 24% of samples (i.e. 46 out of 186 samples analysed) belonging to all milk product categories reported contamination with *Staphylococcus aureus*. Maximum non-compliant samples were Paneer (more than 61.1%), followed by Chhena (33.3%), Chhena based dessert (31.3%), Khoa (8.9%) and Khoa based dessert (7.3%), out of the samples analysed for each milk product category.
- Other hotspots for *S. aureus* (with higher than national average of 2.4%) are Chhattisgarh, Karnataka, Tamil Nadu and Maharashtra with respect to samples analysed from respective States/ UTs.
- No sample from Andaman & Nicobar Islands, Andhra Pradesh, Chandigarh, Dadra & Nagar Haveli, Daman & Diu, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu And Kashmir, Kerala, Madhya Pradesh, Manipur, Meghalaya, Odisha, Punjab, Rajasthan, Sikkim, Uttar Pradesh, and Uttarakhand were detected positive for *S. aureus* (Annexure XV).

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### **C. Coliform Count**

- Overall, 509 samples (18.2% of 2801 samples) were non-compliant on account of higher coliform count, while none of the samples from Chandigarh, Sikkim and Goa were non-compliant on account of Coliform count. Coliform count helps to identify dairy products that may have been exposed to unhygienic conditions.
- Maximum percentage of non-compliant samples were from Andaman & Nicobar Islands (100.0%) followed by Daman & Diu (50.0%), Dadra & Nagar Haveli (40.0%), Bihar (37.6%), Madhya Pradesh (35.5%), Maharashtra (31.3%), Gujarat (27.7%), Tamil Nadu (25.9%), Odisha (20.3%), Karnataka (19.3%), Jharkhand (18.6%), Andhra Pradesh (18.1%), Kerala (17.1%), Chhattisgarh (11.5%), Uttarakhand (11.1%), Rajasthan (10.0%), Jammu & Kashmir (9.6%), Telangana (6.0%), Uttar Pradesh (5.1%), Haryana (3.8%), Manipur (3.8%), Punjab (3.8%), Meghalaya (2.5%) and Himachal Pradesh (2.2%).
- 37.6% (192) samples out of the 510 Paneer samples analysed, were non-compliant for higher Coliform count across States/UTs viz. Andaman & Nicobar Islands (100.0%), Dadra & Nagar Haveli (100.0%), Bihar (88.9%), Tamil Nadu (88.6%), Karnataka (85.7%), Daman & Diu (66.7%), Kerala (66.7%), Telangana (57.1%), Gujarat (47.2%), Maharashtra (46.7%), Uttarakhand (38.5%) Madhya Pradesh (34.1%), Odisha (29.2%), Andhra Pradesh (28.6%), Jammu and Kashmir (26.3%), Chhattisgarh (25.0%), Jharkhand (23.8%), Himachal Pradesh (12.5%), Uttar Pradesh (10.2%), Punjab (8.7%), Manipur (8.3%) and Haryana (5.0%).
- 27.6% (21) of Chhena samples out of total 76 samples analysed, were non-compliant in Coliform count in States/UTs viz. Andaman & Nicobar Islands (100.0%), Bihar (61.1%), Jharkhand (50.0%), Manipur (50.0%), Odisha (25.0%), Uttar Pradesh (12.9%) and Madhya Pradesh (12.5%).
- 23.4 % (85) samples of Khoa out of the total 363 samples analysed, were non-compliant for higher Coliform count. Maximum non-compliance was observed in samples from Andaman & Nicobar Islands (100.0%) followed by Maharashtra (66.7%), Gujarat (53.8%), Madhya Pradesh (48.0%), Tamil Nadu (47.8%), Telangana (40.0%), Karnataka (33.3%), Chhattisgarh (26.7%), Jharkhand (22.2%), Odisha (18.2%), Andhra Pradesh (14.3%), Uttarakhand (14.3%), Bihar (13.3%) and Haryana (4.3%).
- 14.4% (86) samples out of 596 Chhena based dessert samples analysed, were non-compliant for higher coliform count; majority being from Daman & Diu (50%) followed by Madhya Pradesh (29.6%), Dadra & Nagar Haveli (33.3%) and Rajasthan (20%) and Rajasthan (20%). 10%(125) of 1256 analyzed Khoa-based dessert samples were non-compliant, mostly from Madhya Pradesh (42.9%), Bihar(40.6%) and Maharashtra (30%) [Refer: Annexure-XVI].

### **D. Yeast and Mold count**

- 839 samples (29.9% of total 2801 samples) were found non-compliant for yeast and mold count. Yeast and mold count indicate contamination of milk products due to environmental hygiene parameters. Among the analyzed samples, majority of the non-compliant samples were drawn from Andaman & Nicobar Islands (100.0%) followed by Daman & Diu (60.0%), Goa (60.0%), Punjab (49.5%), Madhya Pradesh (48.2%), Dadra & Nagar Haveli (40.0%), Rajasthan (40.0%), Chandigarh (40.0%) Bihar (37.1%), Uttar

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Pradesh (36.9%), Maharashtra (33.3%), Gujarat (33.1%), Tamil Nadu (32.2%), Haryana (33.3%), Jammu and Kashmir (31.5%), Kerala (28.6%), Karnataka (27.1%), Sikkim (26.3%), Uttarakhand (22.2%), Himachal Pradesh (20.0%), Jharkhand (18.6%), Meghalaya (17.5%), Telangana (16.9%), Odisha (12.4%), Chhattisgarh (9.2%), Andhra Pradesh (8.3%) and Manipur (7.5%).

- 55.3% (282) samples of Paneer were found non-compliant for yeast and mold count ; maximum being from Andaman & Nicobar Islands (100.0%), Dadra & Nagar Haveli (100.0%), Rajasthan (100.0%), followed by Tamil Nadu (94.3%), Karnataka (90.5%), Kerala (88.9%), Bihar (86.1%), Telangana (85.7%), Punjab (82.6%), Jammu & Kashmir (78.9%), Daman & Diu (66.7%), Uttarakhand (53.8%), Uttar Pradesh (55.7%), Sikkim (50.0%), Himachal Pradesh (50.0%), Gujarat (47.2%), Maharashtra (46.7%), Madhya Pradesh (43.2%), Haryana (33.3%), Jharkhand (33.3%), Odisha (20.8%), Manipur (16.7%), Chhattisgarh (14.3%) and Andhra Pradesh (14.3%).
- 41.6% (151) samples of Khoa were found non-compliant on account of higher yeast and mold count; mostly from Andaman & Nicobar Islands (100.0%), Meghalaya (100.0%), followed by Tamil Nadu (73.9%), Punjab (69.2%), Maharashtra (66.7%), Karnataka (66.7%), Telangana (60.0%), Gujarat (53.8%), Madhya Pradesh (50.0%), Rajasthan (50.0%), Uttarakhand (42.9%), Haryana (39.1%), Uttar Pradesh (38.3%), Andhra Pradesh (28.6%), Bihar (15.6%), Chhattisgarh (13.3%), Jharkhand (11.1%) and Odisha (9.1%).
- 44.7% (34) samples of Chhena were found non-compliant on account of higher yeast and mold count; maximum being from Andaman & Nicobar Islands (100.0%), followed by Haryana (75.0%), Bihar (55.6%), Manipur (50.0%), Uttar Pradesh (45.2%), Madhya Pradesh (37.5%) and Odisha (25.0%).
- 21.1% (126) samples out of the 596 samples of Chhena based desserts analyzed, were non-compliant in yeast and mold count. Majority of the non-compliant was found in samples drawn from Bihar (43.8%), Himachal Pradesh (36.4%), Gujarat (30.6%) and Maharashtra (27.5%). Similarly, 19.6% (246) samples out of the 1256 samples of Khoa based desserts analyzed were non-compliant in yeast and mold count. Majority of non-compliance was reported from Chandigarh (66.7%), Daman & Diu (66.7%), Goa (66.7%) and Punjab (39.6%) [Refer: Annexure-XVII].

### **E. Aerobic Plate count**

- 766 samples (27.3% of 2801 samples) were found non-compliant for Aerobic Plate Count (APC); Aerobic Plate count is used to indicate the microbial load in the milk product.
- Maximum non-compliant samples were from Andaman & Nicobar Islands (100.0%) followed by Daman and Diu (50.0%), Goa (50.0%), Madhya Pradesh (48.6%), Jharkhand (46.1%), Odisha (41.2%), Dadra & Nagar Haveli (40.0%), Maharashtra (40.0%), Gujarat (34.5%), Tamil Nadu (30.7%), Chhattisgarh (30.5%), Andhra Pradesh (27.8%), Bihar (25.8%), Rajasthan (30.0%), Punjab (23.8%), Karnataka (21.8%), Kerala (21.4%), Haryana (21%), Sikkim (21.1%), Uttar Pradesh (19.2%), Telangana (12.6%), Uttarakhand (6.3%), Meghalaya (5.0%), Manipur (3.8%) and Jammu & Kashmir (2.7%).
- 45.5 % (232) samples of Paneer were non-compliant for APC; mainly from Andaman & Nicobar Islands (100.0%) and Dadra & Nagar Haveli (100.0%) followed by Tamil Nadu

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(94.3%), Karnataka (90.5%), Kerala (83.3%), Telangana (71.4%), Odisha (70.8%), Daman & Diu (66.7%), Bihar (61.1%), Punjab (60.9%), Jharkhand (47.6%), Gujarat (47.2%), Maharashtra (43.3%), Madhya Pradesh (38.6%), Chhattisgarh (35.7%), Andhra Pradesh (28.6%), Uttar Pradesh (28.4%), Haryana (19%), Uttarakhand (15.4%), Manipur (16.7%) and Jammu & Kashmir (5.3%).

- 42.4% (154) samples of Khoa were found non-compliant for APC, mainly from Andaman & Nicobar Islands (100.0%) followed by Tamil Nadu (69.6%), Jharkhand (66.7%), Karnataka (66.7%), Maharashtra (66.7%), Chhattisgarh (60.0%), Madhya Pradesh (60%), Andhra Pradesh (57.1%), Telangana (40.0%), Rajasthan (50%), Haryana (39.1%), Punjab (30.8%), Bihar (22.2%) and Uttar Pradesh (22.2%) with respect to samples analysed from respective States/UTs.
- 25% (19) samples of Chhena were found non-compliant for APC from the States/ UTs Andaman & Nicobar Islands (100.0%), Haryana (50.0%), Jharkhand (50.0%), Madhya Pradesh (37.5%), Odisha (25.0%), Uttar Pradesh (22.6%), Maharashtra (42.5%) and Bihar (16.7%).
- 16.8% (100) samples of Chhena based desserts were found non-compliant for APC mainly from Madhya Pradesh (60%), Gujarat (33.3%) and Maharashtra (43.3%).
- 20.8% (261) samples of Khoa based desserts were found non-compliant for APC, mainly from Goa (55.6%), Jharkhand (53.7%) and Daman and Diu (50%) [Refer: Annexure-XVIII].
- Figure 5A below displays the product-wise numbers of non-compliance to microbiological safety and hygiene indicators.

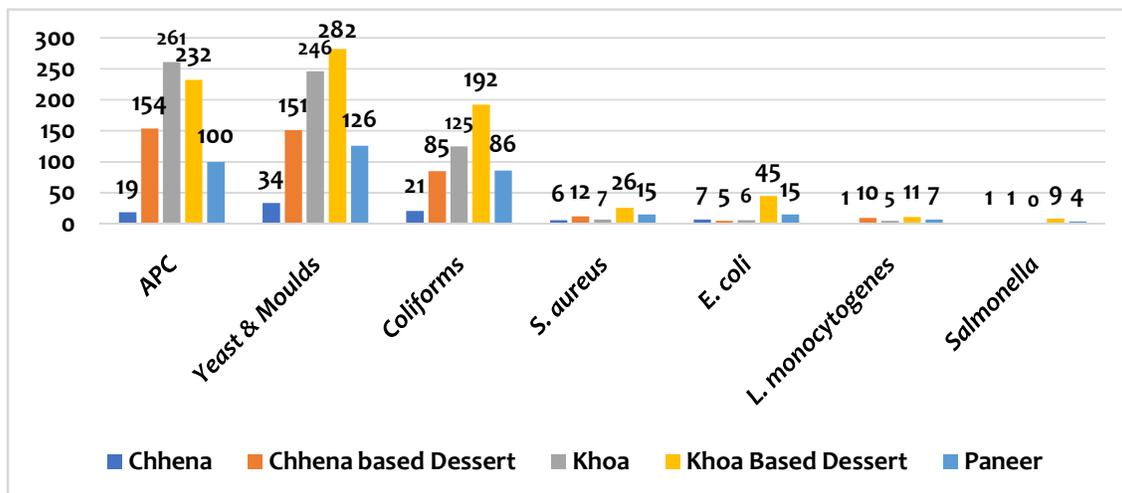


Figure 5A: Product wise numbers of non-compliance to microbiological tests

### 3.3.3. CHEMICAL QUALITY INDICATORS

#### 3.3.3.1. ADULTERATION INDICATORS:

##### A. Butyro-Refractometer (BR) Reading at 40°C

Butyro-Refractometer reading is the index of the purity of milk fat. Deviation from specified range of BR reading indicates adulteration of milk fat with foreign fats such as

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vegetable oils or animal origin fats). As per FSSR, 2011, the extracted fat from Khoa shall meet the standards for Reichert Meissl value, Polenske value and Butyro-refractometer reading as prescribed for Ghee. The standards for milk-based desserts are not prescribed under FSSR, 2011. However, for the purpose of this study, limits of BR reading given for milk fat under sub regulation 2.1.8 of FSS (Food Product Standard and Food Additives) Regulations, 2011 are used to check the trend of adulteration and for generating data.

Butyro-Refractometer reading was analyzed in Khoa (363 samples) and Chhena Based dessert (596 samples) and Khoa Based Dessert samples (1256 samples) amounting to a total of 2215 samples. In Khoa samples: 1.65% (6) was found non-compliant to meet the specifications of FSSR. Tamil Nadu reported the maximum non-compliance (56.5%) followed by Andaman & Nicobar Islands (50.0%), Telangana (40.0%), Himachal Pradesh (33.3%), Jharkhand (11.1%), Punjab (7.7%), Uttar Pradesh (4.9%), Maharashtra (3.7%) and Bihar (2.2%). [Refer: Annexure-XIX]. In Dessert samples, 2.9% (17) samples of Chhena based desserts and 9.9% (124) samples of Khoa based desserts were found deviating from the limits of BR reading of milk fat (referred for this survey purpose only). State-wise observation of dessert samples with samples deviating from the range of BR reading for milk fat is given at Annexure-XXIV. It is pertinent to mention that, as per the revised standards notified vide Gazette Notification dated 27<sup>th</sup> December, 2021, the limits of BR reading at 40°C for Khoa can range from 40.0-44.0. Accordingly, the results obtained were analysed and 06 samples were found to be non-compliant.

### **B. Test for Added Starch and Sugar**

Test for added starch and sugar was carried out only in 363 Khoa samples. Out of which 8 samples were found non-compliant for added starch and sugar in Khoa from Bihar (4 samples), Chhattisgarh (3 samples) and Jharkhand (1 sample). [Refer: Annexure-XXII].

### **C. Reichert- Meissl Value (RM Value)**

RM was analysed only in 363 Khoa samples as per the requirements of FSSR, 2011. No sample was found non-compliant. The Reichert value is an indicator of how much volatile fatty acid can be extracted from fat through saponification. In other words, RM value number is an indicator of non-fat compounds in edible fats like butter and ghee. Hence, it helps in determining the purity of ghee and butter.

### **3.3.3.2. INDICATORS OF SUBSTANDARD QUALITY:**

#### **A. Milk Fat:**

- Milk fat was analyzed in total 949 samples consisting of 510 samples of Paneer, 363 samples of Khoa and 76 samples of Chhena out of which 23.3% (221) samples were found to be non-compliant.
- 100% non-compliance was observed in samples drawn from Andaman & Nicobar Islands, Daman & Diu and Goa followed by Gujarat (61.2%), Telangana (50.0%), Tamil Nadu (46.6%), Madhya Pradesh (45.1%), Maharashtra (39.7%), Karnataka (24.2%), Kerala (21.1%), Jharkhand (18.8%), Odisha (17.9%), Jammu and Kashmir (16.7%), Bihar (14.1%), Haryana (12.5%), Meghalaya (11.1%), Rajasthan (11.1%), Uttarakhand (10.0%), Uttar Pradesh (9.5%), Himachal Pradesh (9.1%), Punjab (8.3%), Andhra Pradesh (7.1%) and Chhattisgarh (6.4%) with respect to samples analyzed from respective State/UTs.

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However, no sample from Chandigarh, Dadra Nagar & Haveli, Manipur and Sikkim reported non-compliance for milk fat.

- 28.4% (145) samples of Paneer were found to be non-compliant to meet the requirements of milk fat. Out of this, maximum non-compliance was observed in samples drawn from Andaman & Nicobar Islands (100.0%), Daman & Diu (100.0%), Goa (100.0%), followed by Madhya Pradesh (84.1%), Gujarat (75.0%), Telangana (71.4%), Maharashtra (66.7%), Tamil Nadu (37.1%), Karnataka (28.6%), Odisha (25.0%), Kerala (22.2%), Bihar (19.4%), Jharkhand (14.3%), Jammu & Kashmir (10.5%), Haryana (10.0%), Uttar Pradesh (5.7%), Punjab (4.3%) and Chhattisgarh (3.6%).
- 18.2% (66) samples of Khoa were non-compliant for milk fat out of which maximum non-compliance were from Andaman & Nicobar Islands (100.0%), followed by Tamil Nadu (60.9%), Meghalaya (50.0%), Jammu & Kashmir (40.0%), Himachal Pradesh (33.3%), Uttarakhand (28.6%), Gujarat (23.1%), Jharkhand (22.2%), Telangana (20.0%), Karnataka (16.7%), Uttar Pradesh (16.0%), Punjab (15.4%), Andhra Pradesh (14.3%), Bihar (13.3%), Chhattisgarh (13.3%), Haryana (13.0%), Rajasthan (12.5%), Madhya Pradesh (10.0%), Odisha (9.1%) and Maharashtra (7.4%).
- In Chhena, the percentage of non-compliance in milk fat was observed in 13.2%(10) of the 76 samples analyzed, maximum from Andaman & Nicobar Islands (100.0%) and Maharashtra (100.0%) followed by Jharkhand (50.0%), Madhya Pradesh (50.0%), Bihar (5.6%) and Uttar Pradesh (3.2%). [Refer: Annexure-XX].

### **B. Moisture**

- Moisture was analyzed in a total of 586 samples consisting of Chhena (76 samples) and Paneer (510 samples), out of which 3.8% (22) samples reported higher moisture content than the permitted limits. The bifurcation of 22 non-compliant samples was 01 sample of Chhena and 21 samples of Paneer.
- Overall, maximum non-compliance was reported in samples from Odisha (21.4%) followed by Telangana (14.3%), Jammu & Kashmir (10.5%), Jharkhand (8.7%), Haryana (8.0%), Bihar (5.6%), Karnataka (4.8%), Punjab (4.3%), Uttar Pradesh (2.5%) and Tamil Nadu (2.9%).
- 4.1% (21) samples of Paneer recorded higher than prescribed limit of moisture content. The non-compliant States/UTs were Odisha (25.0%), Telangana (14.3%), Jammu & Kashmir (10.5%), Haryana (9.5%), Jharkhand (9.5%), Bihar (5.6%), Karnataka (4.8%), Punjab (4.3%), Uttar Pradesh (3.4%) and Tamil Nadu (2.9%), while only 1.3% (1) sample of Chhena from Bihar recorded higher moisture content than the prescribed limit [Refer: Annexure-XXI].

### **C. Total Ash**

Total ash was analyzed in 363 Khoa samples as per FSSR, 2011 requirements. Only 0.6% (2) samples of Khoa reported non-compliance, which included one sample each from Bihar and Chhattisgarh [Refer: Annexure-XXII].

### **D. Total Solids**

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Total solids were analyzed in 363 Khoa samples as per FSSR, 2011 requirements. Total 2.2% (8) samples reported non-compliance for total solids; majority being from Rajasthan (3), followed by Uttar Pradesh (2), Uttarakhand (1), Gujarat (1) and Punjab (1) [Refer: Annexure-XXII].

### **E. Titratable Acidity**

Titratable acidity was analysed in 363 Khoa and 1852 Dessert samples. Only 0.3% (1 sample) of Khoa was non-compliant for Titratable acidity from Karnataka. Further, 0.3% (6) samples of desserts were reported to have Titratable acidity above 0.9% which is the prescribed limits for Khoa under FSSR, 2011 and referred for this survey due to non-availability of standards for milk-based desserts. [Refer: Annexure-XXII and XXIII].

### **F. Synthetic Food Colour**

Synthetic food colours were analysed in 1852 dessert samples. Out of these, 2 samples (0.15%) of Khoa-based dessert were found to be non-compliant as the amount of synthetic food colours (Tartrazine and sunset yellow) was higher than the permitted FSSAI limits. Non-compliance of Tartrazine was found in one sample of Milk Burfi from Tamil Nadu and Sunset Yellow in one sample of Kala Jamun from Telangana [Refer: Annexure XXII].

### **3.4. STUDY OF NON-COMPLIANCE IN ORGANIZED AND UNORGANIZED SECTORS**

Out of the total 1133 non-compliant samples, maximum non-compliance i.e., 1021 (90.1%) samples were from unorganized sector and 112 (9.8%) samples were from organized sector (Table 3). Overall non-compliance of the samples, especially in unorganized sector indicated major issues in process hygiene parameters. Out of total 1044 non-compliant samples in microbiological hygiene indicator category, 89.4% (934 samples) and 10.5% (110 samples) were from unorganized and organized sectors respectively, out of which the presence of yeast & mold count, aerobic plate count and coliform count were major contributors.

The presence of these microbes in products indicates compromise in hygienic conditions during the preparation of milk products. In Khoa samples, none of the samples failed on account of microbiological safety parameters collected from organized sector, while non-compliance in unorganized sector was observed mostly in process hygiene parameters (52%) followed by chemical quality indicators (25.6%) and microbiological safety parameters (2.8%). A similar trend was observed in Paneer (from organized sector), wherein none of the samples failed in microbiological safety indicator, while Paneer (from unorganized sector) had higher failures in process hygiene parameters (63.4%), followed by chemical parameters (36.9%) and microbiological safety (5%) parameters.

Under dessert category, 29.7% (331 samples) and 4.2% (6 samples) of Khoa-based dessert were found non-compliant from unorganized and organized sector, respectively, while 31.6% (140 samples) and 13.7% (21 samples) of Chhena-based dessert were found non-compliant from unorganized and organized sector, respectively. The non-compliance in both desserts was again attributed to failure in process hygiene indicators.

Table 3: Details of samples picked from Organized and Unorganized Sectors

Type of samples	Total Number of samples	Number of compliant samples	% of compliant Samples	Number of non-compliant samples	% of non-compliant Samples
Chhena	0	0	0	0	0
Khoa	10	5	50	5	50
Paneer	128	48	37.5	80	62.5
Chhena based Dessert	153	132	86.3	21	13.7
Khoa based Dessert	142	136	95.8	6	4.2
<b>Organized</b>	<b>433</b>	<b>321</b>	<b>74.1</b>	<b>112</b>	<b>25.9</b>
Chhena	76	33	43.4	43	56.6
Khoa	353	138	39.1	215	60.9
Paneer	382	91	23.8	291	76.2
Chhena based Dessert	443	303	68.4	140	31.6
Khoa based Dessert	1114	782	70.2	332	29.8
<b>Unorganized</b>	<b>2368</b>	<b>1347</b>	<b>56.9</b>	<b>1021</b>	<b>43.1</b>
<b>Grand Total</b>	<b>2801</b>	<b>1668</b>	<b>59.6%</b>	<b>1133</b>	<b>40.4%</b>

**4. KEY FINDINGS**

- Of the total (2801) samples tested, 59.6% (1668) of the samples were compliant as per the FSSR requirements while the remaining 40.4% (1133) were found non-compliant for at least one parameter. Among these analysed samples, 433 were from the organized sector and 2368 samples were from the unorganized sector.
- All samples drawn from organized sector were found to be compliant to labelling requirements as laid down under FSSR, 2011. Further, all the samples from the organized sector were found to be compliant for both chemical and microbiological safety parameters.
- In organized sector, none of the sample was found unsafe for human consumption. However, 25.9% (112) samples out of the 433 samples drawn from the organized sector were found substandard on account of microbiological hygiene indicators (110 samples; 24.8%) and chemical quality parameters (16 samples; 3.69%) which is indicative of compromise in hygiene or quality parameters in organized sector.
- Overall, 40% (1131) of samples were found substandard, indicating poor sanitation practices and hygiene conditions in the processing units, adulteration with foreign fat, high moisture content, milk fat below specified limits and so on. Further, majority of the non-compliant samples i.e., 36.37% (1019) out of the 2368 samples drawn from unorganized sector were non-compliant on account of microbiological hygiene criteria.
- All tested samples from the unorganized sector were found to be compliant with respect to chemical safety parameters. However, 1.98% (47) samples all belonging to the unorganized sector were found unsafe on account of microbiological safety

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indicators (*Listeria* and *Salmonella*), Incidents of contamination with *Listeria* (in more than 1.2% samples) were more profound than contamination with *Salmonella*. Maximum non-compliance was observed in Paneer followed by Khoa, Chhena and desserts.

- In unorganized sector, 36.37% (1019) samples were found substandard on account of microbiological hygiene indicators (934 samples; 33.3%) and chemical quality parameters (245 samples; 8.74%), while 1.6% (45) samples were non-compliant to both chemical quality and microbiological hygiene parameters.
- Among the chemical safety parameters viz. Pesticide residues, Heavy metals and Melamine, none of the samples drawn from either organized or unorganized sector was found to be non-compliant.
- Amongst the milk products, Paneer had maximum non-compliance (i.e., 371 samples were non-compliant out of the 510 samples collected (72.7%), followed by Khoa [i.e., 220 samples were non-compliant out of 363 samples collected (60.6%)], Chhena [i.e., 43 samples were non-compliant out of 76 samples collected (56.6%)], Chhena based desserts [i.e., 161 samples were non-compliant out of 596 samples collected (27%)] and Khoa based desserts [i.e., 338 samples were non-compliant out of 1256 samples collected (26.9%)].
- 1.65% (6) samples of Khoa were non-compliant to meet the specifications of BR reading as per FSSR, 2011 indicating a possible adulteration with foreign fat. The adulteration on account of BR reading was observed mostly in States/ UTs of Andaman & Nicobar Islands, followed by Tamil Nadu. Further, out of the 1852 milk-based dessert samples analyzed, 7.6% (141) samples were found to deviate from the limits of BR reading for milk fat/Khoa (also as per the revised standards) which was taken as reference standards in this survey due to non-availability of standards for milk-based desserts under FSSR, 2011.

#### **4.4. COMPARISON OF 2019 SURVEY IN DELHI AND 2020 SURVEY IN INDIA**

As mentioned earlier, FSSAI conducted a pilot survey in Delhi in the year 2019. On comparing the key indicators; it is observed that both the surveys indicate almost similar findings for microbiological safety. Both the surveys reported approx. same level of non-compliance for *Listeria monocytogenes* and *Salmonella* for the total samples analysed. The issue of adulteration of milk products with foreign fat was reported in 32% samples from Delhi, however, in this survey the national average of non-compliant samples (Khoa) in foreign fats is 6.9%, which indicates that practice of adding foreign fats in milk products is not as prevalent across India. More than 95% samples were found to be non-compliant in 2019, while on PAN-India basis it has been reported to be 40.8% in 2020. Comparison of key indicators is tabulated in Annexure-XXV.

#### **5. CONCLUSION**

All India Milk Product Survey-2020 was carried out with the aim to analyse the safety and quality of milk products sold in the country especially during festival times. The overall conclusions of the Milk Product Survey 2020 are given below:

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- Out of the 2801 samples tested, 433 samples were from the organized sector and 2368 samples were from the unorganized sector. This is broadly in line with the reality that in India, larger population is dependent on rural/local dairy farms and petty business operators to meet the demand and supply of milk and milk products. From the results obtained, it is evident that non-compliance in unorganized sector was found higher (43.1% out of 2368 samples) as compared to the organized sector (25.9% out of 433 samples) for all milk products tested in this survey.
- Overall, 40% (1131) of samples were found substandard, indicating poor hygiene and sanitation practices, adulteration with foreign fat, high moisture content and milk fat content below specified limits. In the organized sector, none of the samples was found unsafe for human consumption. However, 25.9% (112) samples from the organized sector were found substandard on account of microbiological hygiene indicators and chemical quality parameters, which is indicative of compromise in hygiene or quality parameters in organized sector.
- The chemical quality parameters like milk fat, moisture, total ash, total solids, Titratable acidity and synthetic colours indicate substandard quality of a milk product. Majority of the samples were non-compliant in the milk fat (221 samples) followed by the moisture (22 samples); while 8 samples were found non-compliant for added starch and sugar but only in Khoa.
- 1.7% (47) samples were found unsafe on account of microbiological safety indicators (*Listeria* and *Salmonella*), 1019 samples were found substandard on account of microbiological hygiene indicators and chemical quality parameters, while 45 samples were non-compliant to both chemical quality and microbiological hygiene parameters.
- Incidences of *Listeria* contamination was mostly observed in States like Sikkim, Bihar, Rajasthan, etc. while contamination with *Salmonella* was found in Bihar and Punjab. This signifies that the presence of these pathogens is more prevalent in Northern and Eastern regions in comparison to Southern and Western regions.
- Predominant non-compliances was observed in process hygiene indicators like aerobic plate count, yeast and molds followed by chemical quality indicators like milk fat and moisture, which indicates poor manufacturing practices and possible adulteration in both organized (3.7% of total 433 sample) and unorganized sector (10.3% of total 2368 samples). The results indicate compromise with hygiene and sanitation practices being followed by food handlers. *Staphylococcus aureus*, being an opportunistic pathogen is transmitted through infected skin and respiratory tracts and can cause mild to severe infections.
- Out of total 2801 samples, 872 were non-compliant exclusively on account of microbiological parameters including both safety and process hygiene parameters. In this, majority 95.1% (830) samples were non-compliant specifically for process hygiene criteria i.e., aerobic plate count, yeast & mold count, coliform count, *E. coli*, and *S. aureus* while the remaining 4.9% (42) samples failed in either or both safety and process hygiene parameters (40 samples in both and 2 samples exclusively in safety).
- It was observed that 78 samples (2.8% of 2801 samples), 66 samples (2.4% of 2801 samples) 509 samples (18.2% of 2801 samples), 839 samples (29.9% of total 2801 samples) and 766 samples (27.3% of 2801 samples) tested in 27 States/UTs were found

to be non-compliant for *Escherichia coli*, *Staphylococcus aureus*, higher coliform count, yeast & mold count and aerobic plate count, respectively. The presence of *Escherichia coli* in the specified quantity of sample as per FSSR, is a matter of concern with respect to safety and hygiene. Most *E. coli* strains are harmless, but some serotypes (EPEC, ETEC etc.) can cause serious food poisoning in their hosts, and are occasionally responsible for food contamination incidents that prompt product recalls.

- 66 samples (2.3% of 2801 samples) were non-compliant on account of the presence of *Staphylococcus aureus* which indicates the contamination from human/ animal surfaces (Source: skin/respiratory tract) and is a major determinant of process hygiene.
- Out of the total samples of milk products tested during the survey, maximum non-compliance was found in Paneer samples in both organized (62.5%) and unorganized sector (76.2%) followed by Khoa (organized- 50% and unorganized- 60.9%). Major non-compliance was observed in Paneer and Khoa for microbiological hygiene indicators followed by chemical quality indicators in both organized and unorganized sector. Out of the 76 samples of Chhena collected from the unorganized sector only, 56.6% (43) samples were found substandard, while 2 samples were found unsafe.
- Overall, the incidence of food borne pathogens which may result in severe health threat to the consumers is confined to unorganized sector only i.e., ~2.0% of total 2368 samples. Presence of food borne pathogens was not detected in samples drawn from the organized sector.
- Manipur is the best performing State/UT in terms of percentage compliance to quality parameters, showing lowest percentage of substandard samples followed by Telangana, Himachal Pradesh, Meghalaya and Karnataka while, the least compliant States/UTs are Andaman & Nicobar Islands, followed by Daman and Diu and Goa, Madhya Pradesh and Punjab. On the other hand, Karnataka, Andaman and Nicobar Islands, Kerala, Andhra Pradesh, Chandigarh, Jharkhand, Uttarakhand, Daman & Diu, Dadra & Nagar Haveli, Gujarat, Madhya Pradesh, Goa, Maharashtra and Telangana showed 100% compliance to safety while Sikkim, Bihar, and Rajasthan showed more than 10% non-compliance to safety.
- The overall trend indicates that the samples drawn from organized sector show better compliance in terms of safety and quality of milk products. However, there is an imminent need for creating awareness in order to address issues indicating poor sanitation practices and hygiene conditions in the processing units, especially in unorganized sector. Further, non-compliance on account of safety and quality parameters can be attributed to malpractices prevalent among the Food Business operators like adulteration with foreign fat and other undesirable ingredients/additives, high moisture content, presence of milk fat below specified limits and so on, which calls for a holistic approach by all Stakeholders to address the key issues prevalent in the system.
- Food safety is a shared responsibility. It needs the combined efforts of food producers, food processors, transporters, suppliers, retailers and handlers, the Government and consumers of milk and milk products. The results of the analysis and data interpretation can serve as useful information requiring further action on the part

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of FSSAI, other Regulatory bodies, Food Business Operators, aligned Departments and Ministries as well as State Governments.

### **6. WAY FORWARD**

The following are the actionable points that emerged out of the Milk Product Survey 2020 and can become the basis for future directions:

- Dairy fat is one of the most complex natural fats because of its fatty acid (FA) composition (Amores and Verito, 2019). Ruminant dairy fat contains more than 400 different FAs varying in carbon chain length, degree, position and configuration of unsaturation. The most widely used methodology for separating and analyzing dairy FA is gas chromatography, coupled to a flame ionization detector (CG-FID). Alternatively, gas chromatography coupled to a mass spectrometer (GC-MS) is also used. Therefore, Department of Science and Technology (DST)/ Department of Biotechnology (DBT)/ CSIR/ICAR may initiate projects to develop rapid kits for differentiating the milk fatty acid profile from the fatty acid profile of oils. This will mitigate the chances of mixing of foreign fat in milk fat.
- The presence of Aflatoxin M<sub>1</sub> (AFM<sub>1</sub>) in dairy products is due to the presence of Aflatoxin B<sub>1</sub> (AFB<sub>1</sub>) in the animal feed (Vaz A. *et. al.*, 2020). At present, FSSAI doesn't have specified limits of AFM<sub>1</sub> for milk products. For this reason, the establishment of maximum limits in dairy products and the validation of methodologies for its detection and quantification are of extreme importance. A thorough scientific study can be taken up to fix the Aflatoxin M<sub>1</sub> levels in a variety of milk products since the moisture content of milk products is different from that of milk.
- Department of Animal Husbandry and Dairying may initiate measures to check the quality of feed, especially for the presence of AFB<sub>1</sub> in feeds which gets converted to AFM<sub>1</sub> in the animal system. Further, until FSSAI starts regulating animal feed, BIS standards for Aflatoxin contamination in different feeds need to be enforced strictly. It is also recommended to impart requisite trainings pertaining to feed products to create awareness among feed manufacturers and dairy farmers.
- States/UTs should conduct strict enforcement drives on regular intervals; carryout regular risk assessment & mitigation studies in vulnerable States/UTs as well as in products with major non-compliance reported in this survey. Further, there is a need to implement stricter monitoring in States/UTs where the percentage of non-compliant samples was found to be higher.
- There is a pressing need to identify and fix limits for quality and safety parameters of dairy based desserts which are currently devoid of established parameters and reference limits.
- The development of rapid and reliable methods for the detection of *Listeria* and *Salmonella* in milk and milk products is the need of the hour in order to ascertain the presence of these pathogens.
- It is important to identify training needs for various stakeholders with respect to the findings of this survey and a SOP must be developed for capacity building and

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implementation of the same. Further, guidelines for hygienic processing and sanitation practices must be brought out for food handlers.

- It is imperative to create awareness among consumers and discourage them to buy products stored at room temperature for products otherwise requiring refrigerated storage in the markets.
- Each State/UT must utilize the Food Safety on Wheels (FSW) provided to them to check the quality and safety of milk products across the State/UT at regular intervals especially from the samples drawn from unorganized sector.
- The FSWs may also be used for creating awareness among consumers and Food Business Operators (FBOs) with respect to the personnel hygiene, equipment hygiene, environmental hygiene and adulteration.
- Department of Animal Husbandry and Dairying (DAHD), Ministry of Food Processing Industries (MoFPI) and the Ministry of Micro, Small & Medium Enterprises (MSME) may coordinate and work towards improving the infrastructure of small and cottage milk processing units through different incentivizing schemes in order to upgrade small scale cottage level units and automation in manufacturing processes.
- The prospective as well as the existing milk processing units should be informed of the Pradhan Mantri Krishi Sampada Yojana and Pradhan Mantri Formalization of Micro Food Processing Enterprises Schemes of MoFPI through regular awareness campaigns. Details about the aforementioned schemes can be found on <https://www.sampada-mofpi.gov.in/> and <https://pmfme.mofpi.gov.in/pmfme/#/Home-Page> respectively.
- Further, in States/UTs where non-compliances have been observed especially in safety parameters, the respective Regional Offices of FSSAI shall be involved to make the concerned FBOs aware of these schemes of MoFPI in order to initiate corrective actions. Additionally, services of the institutions under MoFPI such as National Institute of Food Technology Entrepreneurship and Management (NIFTEM) situated at Kundli, Haryana and at Thanjavur, Tamil Nadu may be involved by the Regional Offices of FSSAI to impart trainings to FBOs of milk processing units.
- The clusters (hubs/mandis) related to milk products, such as Khoa mandi etc. in various States/UTs may be considered for frequent visits by FSW vehicles for testing and awareness generation.
- A comprehensive scheme for sampling, testing and inspection of milk product manufacturing plants (organized and unorganized) has already been developed by the Regulatory Compliance Division of FSSAI to strengthen the self-monitoring aspects and the same has been disseminated vide order F.No. 15023/02/2017-QA (pt.2) dated 10th January, 2020. All dairy units must be instructed to strictly adhere to the said order. Further, the FSOs must be encouraged to draw at least one-fifth of the regulatory samples belonging to the category of milk and milk products.
- Dairy is a high-risk sector vulnerable to food safety challenges. Therefore, States/UTs shall ensure that at least one Food Safety Supervisor must be trained and certified under FoSTaC training programmes for every licensed food business related to milk

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and milk products. Further, petty food businesses must be imparted basic training in handling of milk and milk products.

### 7. GLOSSARY OF TERMS

- **Aerobic plate count (APC)** is intended to indicate the level of microorganism in a product.
- **Aflatoxin M1** is a product of Aflatoxin B1 metabolism that can be found in milk if the cow/ animal is fed with a feed that contains Aflatoxin in it.
- **Butyro-Refractometer (BR)** Reading is the index of the purity of foods like ghee, sweets, fats and oils which can be accurately measured with the help of Butyro-Refractometer Meter or BR meter.
- **Coliforms** are group of Gram-negative, facultative anaerobic rod-shaped bacteria that ferments lactose to produce acid and gas within 48h at 35°C. Help to identify dairy products that may have been exposed to unsanitary conditions.
- **E. coli** is harmless bacteria that live in the intestines of people and animals and contribute to intestinal health. Presence of *E.Coli* indicates fecal contamination and is indicative of poor hygienic practices.
- **Heavy metal** contamination refers to any metallic chemical element that has relatively higher density and is toxic or poisonous at low concentrations.
- **Listeria monocytogenes** is a Gram-positive bacterium. Its ability to grow at temperatures as low as 0°C permits multiplication at typical refrigeration temperatures, greatly increasing its ability to evade control in human food stuffs. The pathogen is responsible for causing Food borne disease called Listeriosis.
- **Melamine**, a nitrogen-rich compound is added into the milk to increase the protein count falsely in milk and dairy products. In some countries, it is approved for use in the manufacturing of some cooking utensils, plates, plastic products, paper, paperboard, and industrial coatings among other things.
- **Organized Sector Samples:** Samples received with details of batch number/ date of manufacture/ best before date, manufacturers' details, Veg/non-veg logo, nutrient details, ingredients, etc. on the package as per the requirements of FSS (Packaging & Labelling) Regulations 2011.
- **Pesticides** are used to protect crops against insects, weeds, fungi, and other Pests. Pesticides play a significant role in food production. They protect and increase yields and the number of times per year a crop can be grown on the same land. This is particularly important in countries that face food shortages.
- **Salmonella** is a Gram-negative bacterium that can cause gastrointestinal illness and fever called Salmonellosis. *Salmonella* can be spread by food handlers who do not wash their hands and/or the surfaces and tools they use between food preparations

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steps, and when people eat raw or under cooked foods. Salmonella can also spread from animals to humans.

- **Staphylococcus aureus** is a gram positive, non-motile, round or cocci shaped bacteria. Presence of *S. aureus* indicates the contamination from human/animal surfaces (Source: skin/respiratory tract).
- **Synthetic food colours** are used as a food additive in the food products to improve appearance.
- **Reichert value (the Reichert-Meissel-Wollny value or number)** is a value determined when examining fat. The Reichert value is an indicator of how much volatile fatty acid can be extracted from fat through saponification.
- **Titrateable Acidity** (also called total acidity) measures the total acid concentration in a food. This quantity is determined by exhaustive titration of intrinsic acids with a standard base.
- **Substandard sample:** Sample found Non-Compliant in Microbial process hygiene or chemical quality indicators.
- **Unorganized Sector Sample:** Sample without any label information as required under FSS (Packaging & Labelling) Regulations 2011.
- **Unsafe sample:** Sample found Non-Compliant in Microbiological safety indicators or chemical safety indicators with respect to *Listeria*, *Salmonella*, pesticide residues, Aflatoxins and heavy metals.
- **Yeast and molds** are large and a diverse group of microscopic food borne fungi includes several hundred species. Both yeasts and molds cause various degrees of deterioration and decomposition of foods. They can invade and grow on virtually any type of food at any time. They are indicative of environmental contamination of food products.

### 8. ABBREVIATIONS USED IN THE REPORT WITH THEIR EXPANDED FORMS

S. No	ABBREVIATIONS		EXPANDED FORMS
1	AFM1	:	AflatoxinM1
2	APC	:	Aerobic Plate Count
3	BR	:	Butyro-Refractometer
4	DO	:	Designated Officers
5	FBOs	:	Food Business Operators
6	FSOs	:	Food Safety Officers
7	FSSR	:	Food Safety and Standards Regulations
8	GC	:	Gas Chromatography
9	GC-MS/MS	:	Gas Chromatography–Mass Spectrometry

10	GMP	:	Good Manufacturing Practices
11	HPLC	:	High Performance Liquid Chromatography
12	ICP-MS	:	Inductively Coupled Plasma-Mass Spectrometry
13	LC-MS/MS	:	Liquid Chromatography–Mass Spectrometry
14	MRLs	:	Maximum Residual Limits
15	NABL	:	National Accreditation Board for Testing and Calibration Laboratories
16	NCML	:	National Collateral Management Services Limited
17	PAN	:	Presence Across Nation
18	SOP	:	Standard Operating Procedure

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**ANNEXURE I: TEST PARAMETERS & SPECIFICATION AS PER FSSR**

<b>ANNEXURE I (A): PARAMETERS FOR DAIRY-BASED DESSERTS</b>				
<b>S.No.</b>	<b>Parameter</b>	<b>Requirements</b>		<b>Unit</b>
		<b>Khoa Based</b>	<b>Chhena / Paneer Based</b>	
	<b>Quality Parameters</b>			
1	BR Reading	Not specified	Not specified	--
2	Titratable Acidity	Not specified	Not specified	%
	<b>Synthetic Food Colours</b>			
3	Brilliant blue FCF	Max 100	Max 100	ppm
4	Fast green FCF	Max 100	Max 100	ppm
5	Indigotine (Indigo carmine)	Max 100	Max 100	ppm
6	Ponceau 4R	Max 100	Max 100	ppm
7	Sunset yellow FCF	Max 100	Max 100	ppm
8	Carmoisine	Max 100	Max 100	ppm
9	Erythrosine	Max 50	Max 50	ppm
10	Tartrazine	Max 100	Max 100	ppm
	<b>Microbiology</b>			
11	Total Plate Count	Max25000	Max 1,50,000	cfu/gm
12	Yeast and mould Count	Max10	Max 50	cfu/gm
13	<i>E. coli</i>	< 10	<10	cfu/gm
14	<i>S. aureus</i>	Max10	Max 10	cfu/gm
15	<i>Salmonella</i>	Absent	Absent	per 25 g
16	<i>L. monocytogenes</i>	Absent	Absent	per g
17	Coliform	Max 50	Max 10	cfu/gm

<b>ANNEXURE I (B): PARAMETERS FOR CHHENA AND PANEER</b>						
<b>S. No.</b>	<b>General Parameters</b>	<b>Limits Chhena &amp; Paneer</b>	<b>Limits Medium Fat Chhena &amp; Paneer</b>	<b>Limits Low fat Chhena</b>	<b>Limits Low fat Paneer</b>	<b>Unit</b>
1	Moisture	Max Chhena 65 & Max Paneer 60	Max 65 Chhena & Max 60 Paneer	Max 70	Max 70	%
2	Milk fat	Min 50	Min 20 & Max 50	Max 20	Max 20	%
<b>Heavy Metals</b>						
4	Lead	Max 2.5	Max 2.5	Max 2.5	Max 2.5	ppm
5	Copper	Max 30	Max 30	Max 30	Max 30	ppm
6	Arsenic	Max 1.1	Max 1.1	Max 1.1	Max 1.1	ppm
7	Tin	Max 250	Max 250	Max 250	Max 250	ppm
8	Cadmium	Max 1.5	Max 1.5	Max 1.5	Max 1.5	ppm
9	Mercury	Max 1.0	Max 1.0	Max 1.0	Max 1.0	ppm
10	Methyl mercury	Max 0.25	Max 0.25	Max 0.25	Max 0.25	ppm
<b>Other Contaminants</b>						
11	Melamine	Max 2.5	Max 2.5	Max 2.5	Max 2.5	ppm
<b>Pesticides</b>						
12	2,4-Dichlorophenoxy Acetic Acid	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm
13	Acephate (expressed as mixture of Methamidophos and acephate).	Max 0.02	Max 0.02	Max 0.02	Max 0.02	ppm
14	Acetamiprid	Max 0.02	Max 0.02	Max 0.02	Max 0.02	ppm
15	Azoxystrobin	Max 0.01	Max 0.01	Max 0.01	Max 0.01	ppm

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16	Sum of benomyl and carbendazim expressed as carbendazim	Max 0.1 (F)	Max 0.1 (F)	Max 0.1 (F)	Max 0.1 (F)	ppm
17	Bifenthrin	Max 0.2	Max 0.2	Max 0.2	Max 0.2	ppm
18	Bitertanol	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm
19	Buprofezin	Max 0.01	Max 0.01	Max 0.01	Max 0.01	ppm
20	Carbaryl	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm
21	Carbendazim	Max 0.1 (F)	Max 0.1 (F)	Max 0.1 (F)	Max 0.1 (F)	ppm
22	Carbofuran (sum of carbofuran and 3-hydroxy carbofuran expressed as carbofuran)	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm
23	Chlorantraniliprole	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm
24	Chlorothalonil	Max 0.07	Max 0.07	Max 0.07	Max 0.07	ppm
25	Chlorpyrifos	Max 0.02	Max 0.02	Max 0.02	Max 0.02	ppm
26	Chlothianidin (Chlothianidin and its metabolites Thiazolymethyl guanidine (TMG), Thiazolymethyl urea (TZMU), Methylnitroguanidine (MNG) TMG)	Max 0.02	Max 0.02	Max 0.02	Max 0.02	ppm
27	Cypermethrin (sum of isomers) (Fat soluble residue)	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm
28	Deltamethrin (Decamethrin)	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm

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29	Dichlorvos (DDVP) (content of dichloroacetaldehyde (D.C.A.) be reported where possible)	Max 0.01	Max 0.01	Max 0.01	Max 0.01	ppm
30	Difenoconazole	Max 0.02	Max 0.02	Max 0.02	Max 0.02	ppm
31	Dimethoate	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm
32	Dinotefuran	Max 0.1	Max 0.1	Max 0.1	Max 0.1	ppm
33	Mancozeb	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm
34	Metiram as CS <sub>2</sub>	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm
35	Edifenphos	Max 0.01 (F)	Max 0.01 (F)	Max 0.01 (F)	Max 0.01 (F)	ppm
36	Emamectin Benzoate	Max 0.01	Max 0.01	Max 0.01	Max 0.01	ppm
37	Ethion (Residues to be determined as ethion and its oxygen analogue and expressed as ethion)	Max 0.5 (F)	Max 0.5 (F)	Max 0.5 (F)	Max 0.5 (F)	ppm
38	Ethofenprox (Etofenprox)	Max 0.02	Max 0.02	Max 0.02	Max 0.02	ppm
39	Fenpropathrin	Max 0.1	Max 0.1	Max 0.1	Max 0.1	ppm
40	Fenvalerate (Fat soluble residue)	Max 0.01 (F)	Max 0.01 (F)	Max 0.01 (F)	Max 0.01 (F)	ppm
41	Fipronil	Max 0.02	Max 0.02	Max 0.02	Max 0.02	ppm
42	Flubendiamide	Max 0.1	Max 0.1	Max 0.1	Max 0.1	ppm
43	Flusilazole	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm
44	Glufosinate Ammonium	Max 0.02	Max 0.02	Max 0.02	Max 0.02	ppm
45	Imidacloprid	Max 0.1	Max 0.1	Max 0.1	Max 0.1	ppm
46	Indoxacarb	Max 0.1	Max 0.1	Max 0.1	Max 0.1	ppm

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47	Kresoxim Methyl	Max 0.01	Max 0.01	Max 0.01	Max 0.01	ppm
48	Methomyl	Max 0.02	Max 0.02	Max 0.02	Max 0.02	ppm
49	Methyl Chlorophenoxy Acetic Acid (MCPA)	Max 0.04	Max 0.04	Max 0.04	Max 0.04	ppm
50	Metolachlor	Max 0.01	Max 0.01	Max 0.01	Max 0.01	ppm
51	Monocrotophos	Max 0.02	Max 0.02	Max 0.02	Max 0.02	ppm
52	Oxydemeton-Methyl	Max 0.01	Max 0.01	Max 0.01	Max 0.01	ppm
53	Paraquat dichloride (Determined as Paraquat cations)	Max 0.01	Max 0.01	Max 0.01	Max 0.01	ppm
54	Penconazole	Max 0.01	Max 0.01	Max 0.01	Max 0.01	ppm
55	Phenthoate	Max 0.01	Max 0.01	Max 0.01	Max 0.01	ppm
56	Phorate (sum of Phorate, its oxygen analogue and their sulphoxides and sulphones, expressed as phorate)	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm
57	Pirimiphos-methyl	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm
58	Propiconazole	Max 0.01	Max 0.01	Max 0.01	Max 0.01	ppm
59	Pyraclostrobin	Max 0.03	Max 0.03	Max 0.03	Max 0.03	ppm
60	Tebuconazole	Max 0.01	Max 0.01	Max 0.01	Max 0.01	ppm
61	Thiacloprid	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm
62	Thiamethoxam	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm
63	Thiophanate-Methyl	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm

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64	Trichlorfon	Max 0.05	Max 0.05	Max 0.05	Max 0.05	ppm
65	Triaccontanol	Max 0.01	Max 0.01	Max 0.01	Max 0.01	ppm
66	Triadimefon	Max 0.01	Max 0.01	Max 0.01	Max 0.01	ppm
<b>Microbiological parameters</b>						
67	<i>S. aureus</i>	Max 10	Max 10	Max 10	Max 10	cfu/g
68	<i>Escherichia coli</i>	< 10	<10	<10	< 10	cfu/g
69	Coliform count	Max 10	Max 10	Max 10	Max 10	cfu/g
70	Yeast & Mould	Max 50	Max 50	Max 50	Max 50	cfu/g
71	<i>Salmonella</i>	Absent	Absent	Absent	Absent	/25g
72	<i>L. monocytogenes</i>	Absent	Absent	Absent	Absent	/g
73	Aerobic Plate Count	Max 1,50,000	Max 1,50,000	Max 1,50,000	Max 1,50,000	cfu/g

<b>ANNEXURE I (C): PARAMETERS FOR KHOA</b>			
<b>S.No.</b>	<b>GENERAL PARAMETERS</b>	<b>LIMITS</b>	<b>UNIT</b>
1	Reichert Meissl value	Ref Annexure I (D)	-
2	Butyro-Refractometer reading		-
3	Shall be free from added starch & added sugar	Free	-
4	Total solid	Min. 55	-
5	Total ash	Max 6.0	%
6	Milk fat on dry basis	Min 30.0	%
7	Titrateable acidity (as lactic acid)	Max 0.9	%
<b>Heavy Metals</b>			
9	Lead	Max 2.5	ppm
10	Copper	max 30	ppm
11	Arsenic	Max 1.1	ppm
12	Tin	Max 250	ppm
13	Cadmium	Max 1.5	ppm
14	Mercury	Max 1.0	ppm
15	Methyl mercury	Max 0.25	ppm
<b>Other Contaminants</b>			
16	Melamine	Max 2.5	ppm
<b>Pesticides</b>			
17	2,4-Dichlorophenoxy Acetic Acid	Max 0.05	ppm
18	Acephate (expressed as mixture of Methamidophos and acephate).	Max 0.02	ppm
19	Acetamiprid	Max 0.02	ppm
20	Azoxystrobin	Max 0.01	ppm
21	Sum of benomyl and carbendazim expressed as carbendazim	Max 0.1 (F)	ppm
22	Bifenthrin	Max 0.2	ppm
23	Bitertanol	Max 0.05	ppm
24	Buprofezin	Max 0.01	ppm
25	Carbaryl	Max 0.05	ppm
26	Carbendazim	Max 0.1 (F)	ppm
27	Carbofuran (sum of carbofuran and 3-hydroxy carbofuran expressed as carbofuran)	Max 0.05	ppm
28	Chlorantraniliprole	Max 0.05	ppm
29	Chlorothalonil	Max 0.07	ppm
30	Chlorpyrifos	Max 0.02	ppm
31	Chlothianidin (Chlothianidin and its metabolites Thiazolymethylguanidine (TMG), Thiazolymethylurea (TZMU),	Max 0.02	ppm

<b>ANNEXURE I (C): PARAMETERS FOR KHOA</b>			
<b>S.No.</b>	<b>GENERAL PARAMETERS</b>	<b>LIMITS</b>	<b>UNIT</b>
	Methylnitroguanidine (MNG)		
32	Cypermethrin (sum of isomers) (Fat soluble residue)	Max 0.05	ppm
33	Deltamethrin (Decamethrin)	Max 0.05	ppm
34	Dichlorvos (DDVP) (content of dichloroacetaldehyde (D.C.A.) be reported where possible)	Max 0.01	ppm
35	Difenoconazole	Max 0.02	ppm
36	Dimethoate	Max 0.05	ppm
37	Dinotefuran	Max 0.1	ppm
38	Mancozeb	Max 0.05	ppm
39	Metiram as CS <sub>2</sub>	Max 0.05	ppm
40	Edifenphos	Max 0.01(F)	ppm
41	Emamectin Benzoate	Max 0.01	ppm
42	Ethion (Residues to be determined as ethion and its oxygen analogue and expressed as ethion)	Max 0.5 (F)	ppm
43	Ethofenprox (Etofenprox)	Max 0.02	ppm
44	Fenpropathrin	Max 0.1	ppm
45	Fenvalerate (Fat soluble residue)	Max 0.01 (F)	ppm
46	Fipronil	Max 0.02	ppm
47	Flubendiamide	Max 0.1	ppm
48	Flusilazole	Max 0.05	ppm
49	Glufosinate Ammonium	Max 0.02	ppm
50	Imidacloprid	Max 0.1	ppm
51	Indoxacarb	Max 0.1	ppm
52	Kresoxim Methyl	Max 0.01	ppm
53	Methomyl	Max 0.02	ppm
54	Methyl Chlorophenoxy Acetic Acid (MCPA)	Max 0.04	ppm
55	Metolachlor	Max 0.01	ppm
56	Monocrotophos	Max 0.02	ppm
57	Oxydemeton-Methyl	Max 0.01	ppm
58	Paraquat dichloride (Determined as Paraquatcations)	Max 0.01	ppm
59	Penconazole	Max 0.01	ppm
60	Phenthoate	Max 0.01	ppm
61	Phorate (sum of Phorate, its oxygen analogue and their sulphoxides and sulphones, expressed as phorate)	Max 0.05	ppm

<b>ANNEXURE I (C): PARAMETERS FOR KHOA</b>			
<b>S.No.</b>	<b>GENERAL PARAMETERS</b>	<b>LIMITS</b>	<b>UNIT</b>
62	Pirimiphos-methyl	Max 0.05	ppm
63	Propiconazole	Max 0.01	ppm
64	Pyraclostrobin	Max 0.03	ppm
65	Tebuconazole	Max 0.01	ppm
66	Thiacloprid	Max 0.05	ppm
67	Thiamethoxam	Max 0.05	ppm
68	Thiophanate-Methyl	Max 0.05	ppm
69	Trichlorfon	Max 0.05	ppm
70	Triacontanol	Max 0.01	ppm
71	Triadimefon	Max 0.01	ppm
<b>Microbiological Parameter</b>			
72	Aerobic Plate count	Max 25000	cfu/g
73	<i>Staphylococcus aureus</i>	Max 10	cfu/g
74	<i>Escherichia coli</i>	<10	cfu/g
75	Coliform count	Max 50	cfu/g
76	Yeast & mould	Max 10	cfu/g
77	<i>Salmonella</i>	Absent	/25g
78	<i>Listeria monocytogenes</i>	Absent	/g

(F)= On fat basis

<b>ANNEXURE I (D): SPECIFICATION FOR BUTYRO-REFRACTROMETER (BR) READING AND REICHERT MEISSL (RM) VALUE</b>			
<b>S. NO.</b>	<b>STATE / UNION TERRITORY</b>	<b>BR READING</b>	<b>RM VALUE (MINIMUM)</b>
1	Andhra Pradesh / Telangana	40.0 to 43.0	24.0
2	Andaman and Nicobar Islands	41.0 to 44.0	24.0
3	Arunachal Pradesh	40.0 to 43.0	26.0
4	Assam	40.0 to 43.0	26.0
5	Bihar	40.0 to 43.0	28.0
6	Chandigarh	40.0 to 43.0	28.0
7	Chhattisgarh	40.0 to 44.0	26.0
8	Dadra and Nagar Haveli	40.0 to 43.0	24.0
9	Delhi	40.0 to 43.0	24.0
10	Goa	40.0 to 43.0	26.0
11	Daman and Diu	40.0 to 43.5	24.0
12	Gujarat a) Areas other than cotton tract areas b) Cotton Tract Areas	40.0 to 43.5 41.5 to 45.0	24.0 21.0
13	Haryana a) Areas other than cotton tract areas b) Cotton Tract Areas	40.0 to 43.0 40.0 to 43.0	28.0 26.0
14	Himachal Pradesh	40.0 to 43.0	26.0
15	Jammu and Kashmir	40.0 to 43.0	26.0
16	Jharkhand	40.0 to 43.0	28.0
17	Karnataka a) Areas other than Belgaum District b) Belgaum District	40.0 to 43.0 40.0 to 44.0	24.0 26.0
18	Kerala	40.0 to 43.0	26.0
19	Lakshadweep	40.0 to 43.0	26.0
20	Madhya Pradesh a) Areas other than cotton tract areas b) Cotton Tract Areas	40.0 to 44.0 41.5 to 45.0	26.0 21.0
21	Maharashtra a) Areas other than cotton tract areas b) Cotton Tract Areas	40.0 to 43.0 41.5 to 45.0	26.0 21.0
22	Manipur	40.0 to 43.0	26.0
23	Meghalaya	40.0 to 43.0	26.0
24	Odisha	40.0 to 43.0	26.0
25	Puducherry	40.0 to 44.0	26.0
26	Punjab	40.0 to 43.0	28.0
27	Rajasthan a) Areas other than cotton tract	40.0 to 43.0	26.0

<b>ANNEXURE I (D): SPECIFICATION FOR BUTYRO-REFRACTROMTER (BR) READING AND REICHERT MEISSL (RM) VALUE</b>			
<b>S. NO.</b>	<b>STATE / UNION TERRITORY</b>	<b>BR READING</b>	<b>RM VALUE (MINIMUM)</b>
	areas b) Cotton Tract Areas	41.5 to 45.0	21.0
28	Tamil Nadu	41.0 to 44.0	24.0
29	Uttar Pradesh	40.0 to 43.0	26.0
30	Uttarakhand	40.0 to 43.0	26.0
31	Sikkim	40.0 to 43.0	28.0

## FSSAI MILK PRODUCT SURVEY- 2020

ANNEXURE II: A SCREEN SHOT OF HOOPER APP USED TO CAPTURE SAMPLE PICKUP DATA (A GLIMPSE OF THE SURVEY)

ANNEXURE II (FIGURE 1): HOOPERPRO SCREENSHOTS OF DETAILS CAPTURED DURING SAMPLE COLLECTION



ANNEXURE II (FIGURE 2): HOOPERPRO REPORT SHOWING STATE-WISE AND PRODUCT-WISE NUMBER OF SAMPLES.

## FSSAI MILK PRODUCT SURVEY- 2020

### ANNEXURE III: DISTRICT-WISE, METRO-WISE AND PRODUCT-WISE NUMBER OF SAMPLES COLLECTED

State/UT and Non Metro Districts	Chhena	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
<b>ANDAMAN AND NICOBAR ISLANDS</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>5</b>
SOUTH ANDAMAN	2	0	2	0	1	5
<b>ANDHRA PRADESH</b>	<b>0</b>	<b>17</b>	<b>7</b>	<b>41</b>	<b>7</b>	<b>72</b>
ANANTAPUR	0	1	0	5	0	6
CHITTOOR	0	1	0	3	1	5
EAST GODAVARI	0	1	0	2	1	4
GUNTUR	0	2	0	4	0	6
KRISHNA	0	0	0	3	2	5
KURNOOL	0	1	1	6	0	8
PRAKASAM	0	2	1	3	1	7
SRI POTTISRIRAMULUNELLORE	0	0	1	3	1	5
SRIKAKULAM	0	3	1	1	0	5
VISAKHAPATNAM	0	2	0	3	0	5
VIZIANAGARAM	0	1	2	2	0	5
WEST GODAVARI	0	1	0	3	1	5
YSR DISTRICT, KADAPA (CUDDAPAH)	0	2	1	3	0	6
<b>BIHAR</b>	<b>18</b>	<b>32</b>	<b>45</b>	<b>55</b>	<b>36</b>	<b>186</b>
ARARIA	0	0	2	3	0	5
ARWAL	0	2	1	1	1	5
AURANGABAD	1	1	1	1	1	5
BANKA	2	1	0	1	1	5
BEGUSARAI	2	0	1	0	2	5
BHAGALPUR	3	0	0	2	0	5
BHOJPUR	2	0	3	0	0	5
BUXAR	0	0	1	2	2	5
GAYA	0	2	0	3	0	5
GOPALGANJ	0	1	3	0	1	5
JAMUI	0	2	1	2	0	5
JEHANABAD	1	0	1	2	1	5
KAIMUR (BHABUA)	1	0	0	2	2	5
KATIHAR	1	0	4	0	0	5
KHAGARIA	0	1	4	0	0	5
KISHANGANJ	2	0	2	1	0	5
LAKHISARAI	2	0	1	1	1	5
MADHEPURA	0	2	1	1	1	5

## FSSAI MILK PRODUCT SURVEY- 2020



State/UT and Non Metro Districts	Chhena	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
MUNGER(MONGHYR)	0	1	1	1	2	5
MUZAFFARPUR	0	3	1	5	0	9
NALANDA	0	1	1	2	1	5
NAWADA	1	1	0	2	1	5
PASHCHIMCHAMPARAN	0	0	1	3	1	5
PATNA	0	2	0	3	2	7
PURBA CHAMPARAN (MOTIHARI)	0	1	1	2	1	5
PURNIA (PURNEA)	0	0	3	1	1	5
ROHTAS	0	1	0	2	2	5
SAHARSA	0	2	0	2	1	5
SAMASTIPUR	0	2	0	1	2	5
SARAN	0	1	2	0	2	5
SHEIKHPURA	0	0	1	3	1	5
SHEOHAR	0	0	2	2	1	5
SITAMARHI	0	1	3	0	1	5
SIWAN	0	0	3	0	2	5
SUPAUL	0	2	0	2	1	5
VAISHALI	0	2	0	2	1	5
<b>CHANDIGARH</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>5</b>
CHANDIGARH	0	1	0	3	1	5
<b>CHHATTISGARH</b>	<b>4</b>	<b>33</b>	<b>15</b>	<b>51</b>	<b>28</b>	<b>131</b>
BALOD	0	1	0	4	0	5
BALODA BAZAR	0	0	0	1	1	2
BALRAMPUR	0	2	0	2	1	5
BASTAR	0	4	0	1	0	5
BEMETARA	0	2	1	0	2	5
BIJAPUR	0	0	0	4	1	5
BILASPUR	1	0	1	2	1	5
DANTEWADA(SOUTH BASTAR)	0	0	1	4	0	5
DHAMTARI	0	1	0	2	2	5
DURG	0	2	0	1	1	4
GARIYABAND	0	1	1	2	1	5
JANJGIR-CHAMPA	0	2	1	1	1	5
JASHPUR	0	1	1	0	3	5
KABIRDHAM(KAWARDHA)	0	1	0	3	1	5
KANKER (NORTH BASTAR)	0	2	0	2	1	5
KONDAGAON	0	2	1	1	1	5
KORBA	0	1	0	3	1	5
KORIYA	0	2	0	2	1	5
MAHASAMUND	0	1	1	2	1	5

## FSSAI MILK PRODUCT SURVEY- 2020



State/UT and Non Metro Districts	Chhena	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
MUNGELI	0	1	0	3	1	5
NARAYANPUR	0	3	1	1	0	5
RAIGARH	2	0	2	1	0	5
RAIPUR	0	0	0	5	0	5
RAJNANDGAON	0	1	2	0	2	5
SUKMA	0	1	0	2	2	5
SURAJPUR	1	1	1	1	1	5
SURGUJA	0	1	1	1	2	5
<b>DADRA &amp; NAGAR HAVELI</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>5</b>
DADRA & NAGARHAVELI	0	1	0	3	1	5
<b>DAMAN AND DIU</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>6</b>	<b>3</b>	<b>10</b>
DAMAN	0	0	0	3	2	5
DIU	0	1	0	3	1	5
<b>GOA</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>1</b>	<b>10</b>
NORTH GOA	0	0	0	5	0	5
SOUTH GOA	0	0	0	4	1	5
<b>GUJARAT</b>	<b>0</b>	<b>36</b>	<b>13</b>	<b>81</b>	<b>36</b>	<b>166</b>
AHMADABAD	0	2	0	2	1	5
AMRELI	0	1	0	3	1	5
ANAND	0	1	0	3	1	5
ARAVALLI	0	1	0	3	1	5
BANAS KANTHA	0	2	1	1	1	5
BHARUCH	0	1	0	3	1	5
BHAVNAGAR	0	0	2	2	1	5
BOTAD	0	0	1	4	0	5
CHHOTA UDEPUR	0	1	0	3	1	5
DAHOD	0	1	1	2	1	5
DEVBHOOMIDWARKA	0	1	1	2	1	5
GANDHINAGAR	0	0	1	3	1	5
GIR SOMNATH	0	1	1	2	1	5
JAMNAGAR	0	0	0	3	2	5
JUNAGADH	0	1	0	4	0	5
KACHCHH	0	2	0	2	1	5
KHEDA (NADIAD)	0	1	0	2	2	5
MAHESANA	0	1	0	3	1	5
MAHISAGAR	0	2	0	2	1	5
MORBI	0	2	1	2	1	6
NARMADA(RAJPIPLA)	0	2	0	2	1	5
NAVSARI	0	1	1	2	1	5
PANCH MAHALS	0	1	1	2	1	5
PATAN	0	1	0	3	1	5
PORBANDAR	0	0	0	3	2	5

## FSSAI MILK PRODUCT SURVEY- 2020



State/UT and Non Metro Districts	Chhena	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
RAJKOT	0	3	1	3	3	10
SABAR KANTHA	0	1	0	3	1	5
SURAT	0	1	1	1	2	5
SURENDRANAGAR	0	1	0	3	1	5
TAPI (VYARA)	0	1	0	3	1	5
VADODARA	0	2	0	2	1	5
VALSAD	0	1	0	3	1	5
<b>HARYANA</b>	<b>4</b>	<b>20</b>	<b>23</b>	<b>37</b>	<b>21</b>	<b>105</b>
AMBALA	0	1	0	3	1	5
CHARKHI DADRI	1	2	1	1	0	5
FARIDABAD	0	1	1	3	0	5
FATEHABAD	0	1	0	2	2	5
GURUGRAM(GURGAON)	0	1	1	2	1	5
HISAR	0	2	0	3	0	5
JHAJJAR	1	1	1	1	1	5
JIND	0	1	1	3	0	5
KAITHAL	0	1	0	4	0	5
KARNAL	0	0	3	0	2	5
KURUKSHETRA	0	0	3	0	2	5
MAHENDRAGARH	0	1	0	3	1	5
NUH	0	1	2	1	1	5
PALWAL	0	1	2	2	0	5
PANCHKULA	0	1	1	1	2	5
PANIPAT	0	0	3	0	2	5
REWARI	0	1	1	2	1	5
ROHTAK	1	1	1	1	1	5
SIRSA	0	0	1	2	2	5
SONIPAT	1	1	1	1	1	5
YAMUNANAGAR	0	2	0	2	1	5
<b>HIMACHALPRADESH</b>	<b>0</b>	<b>11</b>	<b>3</b>	<b>23</b>	<b>8</b>	<b>45</b>
BILASPUR	0	1	0	3	1	5
CHAMBA	0	1	0	4	0	5
HAMIRPUR	0	2	0	2	1	5
KANGRA	0	1	1	3	1	6
KULLU	0	1	1	2	1	5
MANDI	0	2	0	1	1	4
SHIMLA	0	1	0	3	1	5
SOLAN	0	1	0	3	1	5
UNA	0	1	1	2	1	5
<b>JAMMU AND KASHMIR</b>	<b>0</b>	<b>14</b>	<b>5</b>	<b>35</b>	<b>19</b>	<b>73</b>
ANANTNAG	0	0	1	3	1	5
BANDIPORE	0	2	0	2	1	5

## FSSAI MILK PRODUCT SURVEY- 2020



State/UT and Non Metro Districts	Chhena	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
BARAMULLA	0	2	0	3	0	5
BUDGAM	0	1	1	2	1	5
DODA	0	1	1	2	1	5
GANDERBAL	0	1	0	5	2	8
KISHTWAR	0	2	0	2	1	5
KULGAM	0	1	0	3	1	5
KUPWARA	0	1	0	3	1	5
PULWAMA	0	1	0	1	3	5
RAMBAN	0	1	1	1	2	5
SHOPIAN	0	1	0	2	2	5
SRINAGAR	0	0	0	4	1	5
UDHAMPUR	0	0	1	2	2	5
<b>JHARKHAND</b>	<b>2</b>	<b>29</b>	<b>9</b>	<b>41</b>	<b>21</b>	<b>102</b>
BOKARO	0	1	0	3	1	5
CHATRA	0	3	0	1	1	5
DEOGHAR	1	1	0	2	1	5
DHANBAD	0	2	1	1	1	5
DUMKA	0	0	1	2	2	5
GIRIDIH	0	3	1	3	0	7
GODDA	0	1	2	0	2	5
HAZARIBAGH	0	1	0	3	1	5
JAMTARA	1	1	1	1	1	5
KODERMA	0	1	1	2	1	5
LOHARDAGA	0	1	0	4	0	5
PAKUR	0	0	1	4	0	5
PALAMU	0	1	0	2	2	5
PASHCHIMISINGHBHUM	0	2	0	2	1	5
PURBI SINGHBHUM	0	3	1	0	1	5
RAMGARH	0	2	0	2	1	5
RANCHI	0	2	0	2	1	5
SAHIBGANJ	0	1	0	2	2	5
SARAIKELAKHARSWANA	0	2	0	2	1	5
SIMDEGA	0	1	0	3	1	5
<b>KARNATAKA</b>	<b>0</b>	<b>28</b>	<b>10</b>	<b>81</b>	<b>17</b>	<b>136</b>
BAGALKOT	0	0	0	5	0	5
BELGAUM	0	1	0	4	0	5
BELLARY	0	1	1	2	1	5
BIDAR	0	0	3	2	0	5
BIJAPUR	0	2	0	2	1	5
CHAMARAJANAGAR	0	1	0	3	1	5
CHIKKABALLAPURA	0	1	0	3	1	5
CHIKMAGALUR	0	2	0	3	0	5

## FSSAI MILK PRODUCT SURVEY- 2020



State/UT and Non Metro Districts	Chhena	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
CHITRADURGA	0	1	0	2	1	4
DAKSHINA KANNADA	0	1	1	3	0	5
DAVANAGERE	0	1	0	2	1	4
DHARWAD	0	1	0	3	1	5
GADAG	0	0	1	3	1	5
GULBARGA	0	0	0	3	1	4
HASSAN	0	0	0	4	1	5
HAVERI	0	2	1	1	1	5
KODAGU	0	1	0	5	0	6
KOLAR	0	1	1	2	1	5
KOPPAL	0	0	0	3	1	4
MANDYA	0	1	0	3	0	4
MYSORE	0	1	0	4	0	5
RAICHUR	0	1	1	3	0	5
RAMANAGARA	0	2	0	3	0	5
SHIMOGA	0	1	0	3	1	5
TUMKUR	0	2	0	2	1	5
UDUPI	0	1	0	3	1	5
UTTARA KANNADA	0	1	1	2	1	5
YADGIR	0	2	0	3	0	5
<b>KERALA</b>	<b>0</b>	<b>9</b>	<b>1</b>	<b>42</b>	<b>18</b>	<b>70</b>
ALAPPUZHA	0	1	0	2	2	5
ERNAKULAM	0	0	0	5	0	5
IDUKKI	0	1	0	2	2	5
KANNUR	0	0	0	5	0	5
KASARAGOD	0	1	0	4	0	5
KOLLAM	0	1	0	3	1	5
KOTTAYAM	0	1	0	4	0	5
KOZHIKODE	0	1	0	1	3	5
MALAPPURAM	0	1	0	3	1	5
PALAKKAD	0	1	0	2	2	5
PATHANAMTHITTA	0	0	0	4	1	5
THIRUVANANTHAPURAM	0	0	0	3	2	5
THRISSUR	0	1	0	2	2	5
WAYANAD	0	0	1	2	2	5
<b>MADHYAPRADESH</b>	<b>8</b>	<b>35</b>	<b>50</b>	<b>108</b>	<b>44</b>	<b>245</b>
AGAR MALWA	0	0	1	2	1	4
ALIRAJPUR	0	0	0	5	0	5
ANUPPUR	0	0	0	4	1	5
ASHOKNAGAR	0	0	2	3	0	5
BALAGHAT	0	1	1	2	1	5
BARWANI	0	0	2	1	2	5

## FSSAI MILK PRODUCT SURVEY- 2020



State/UT and Non Metro Districts	Chhena	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
BETUL	0	2	0	2	1	5
BHIND	1	0	2	1	1	5
BHOPAL	1	0	1	2	1	5
BURHANPUR	0	0	3	0	2	5
CHHATARPUR	0	1	1	3	0	5
CHHINDWARA	0	0	1	3	1	5
DAMOH	0	2	0	2	1	5
DATIA	0	0	2	1	2	5
DEWAS	0	1	0	3	1	5
DHAR	0	1	1	1	1	4
GUNA	0	1	2	1	1	5
GWALIOR	0	2	1	1	1	5
HARDA	0	2	1	1	1	5
HOSHANGABAD	0	1	2	1	1	5
INDORE	0	1	1	2	1	5
JABALPUR	0	1	1	2	1	5
JHABUA	0	1	2	1	1	5
KATNI	2	0	0	2	1	5
KHANDWA (EAST NIMAR)	0	1	1	2	1	5
KHARGONE(WESTNIMAR)	0	1	0	3	1	5
MANDLA	0	2	1	1	1	5
MANDSAUR	0	0	1	3	1	5
MORENA	0	1	2	1	1	5
NARSINGHPUR	2	0	1	2	0	5
NEEMUCH	0	1	1	2	1	5
PANNA	1	0	1	2	1	5
RAISEN	0	0	1	4	0	5
RAJGARH	0	1	2	2	0	5
RATLAM	0	0	0	2	1	3
REWA	0	0	1	2	2	5
SAGAR	0	0	1	4	0	5
SATNA	0	1	2	1	1	5
SEHORE	0	1	1	2	1	5
SEONI	0	1	1	2	1	5
SHAHDOL	0	2	1	1	1	5
SHAJAPUR	0	0	1	2	1	4
SHEOPUR	0	1	1	2	1	5
SHIVPURI	0	2	0	3	0	5
SIDHI	0	1	1	2	1	5
SINGRAULI	0	0	1	3	1	5
TIKAMGARH	1	0	1	2	1	5
UJJAIN	0	2	0	2	1	5

## FSSAI MILK PRODUCT SURVEY- 2020



State/UT and Non Metro Districts	Chhena	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
UMARIA	0	0	0	5	0	5
VIDISHA	0	0	0	5	0	5
<b>MAHARASHTRA</b>	<b>1</b>	<b>31</b>	<b>23</b>	<b>84</b>	<b>25</b>	<b>164</b>
AHMADNAGAR	0	1	2	2	1	6
AKOLA	0	1	0	4	0	5
AMRAVATI	0	1	0	3	1	5
AURANGABAD	0	1	1	2	1	5
BEED	0	1	0	3	1	5
BHANDARA	0	1	0	3	1	5
BULDANA	0	0	1	2	1	4
BULDHANA	0	1	0	0	0	1
CHANDRAPUR	0	1	1	2	1	5
DHULE	0	0	1	3	1	5
GADCHIROLI	0	1	0	4	1	6
GONDIYA	0	2	0	2	1	5
JALGAON	0	0	1	3	0	4
JALNA	0	2	2	1	0	5
KOLHAPUR	0	1	1	3	0	5
LATUR	0	0	0	5	0	5
NAGPUR	0	1	1	2	1	5
NANDED	0	1	1	2	1	5
NANDURBAR	0	1	0	4	0	5
NASHIK	0	1	1	1	1	4
OSMANABAD	1	1	1	1	1	5
PALGHAR	0	1	0	3	1	5
PARBHANI	0	1	1	2	1	5
PUNE	0	1	1	2	1	5
RAIGARH	0	1	0	3	1	5
RATNAGIRI	0	1	0	4	0	5
SANGLI	0	0	0	3	1	4
SATARA	0	2	0	2	1	5
SINDHUDURG	0	0	1	2	2	5
SOLAPUR	0	1	1	2	1	5
THANE	0	0	3	1	1	5
WARDHA	0	1	1	2	1	5
WASHIM	0	1	0	4	0	5
YAVATMAL	0	2	1	2	0	5
<b>MANIPUR</b>	<b>2</b>	<b>14</b>	<b>1</b>	<b>24</b>	<b>12</b>	<b>53</b>
BISHNUPUR	0	3	0	2	1	6
CHANDEL	0	2	0	1	2	5
CHURACHANDPUR	0	2	0	2	0	4
IMPHAL EAST	0	1	0	3	1	5

## FSSAI MILK PRODUCT SURVEY- 2020



State/UT and Non Metro Districts	Chhena	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
IMPHAL WEST	1	0	1	2	1	5
KAKCHING	0	1	0	2	1	4
KAMJONG	0	1	0	3	1	5
KANGPOKPI	1	0	0	3	1	5
SENAPATI	0	1	0	1	1	3
TENGNUPAL	0	1	0	1	0	2
THOUBAL	0	1	0	3	1	5
UKHRUL	0	1	0	1	2	4
<b>MEGHALAYA</b>	<b>0</b>	<b>19</b>	<b>2</b>	<b>12</b>	<b>7</b>	<b>40</b>
EAST GARO HILLS	0	1	0	0	1	2
EAST JAINTIA HILLS	0	3	0	2	0	5
NORTH GARO HILLS	0	2	0	0	1	3
RI BHOI	0	1	0	2	2	5
SOUTH GARO HILLS	0	2	0	1	2	5
SOUTH WEST GARO HILLS	0	4	0	1	0	5
SOUTH WEST KHASI HILLS	0	2	0	2	1	5
WEST GARO HILLS	0	1	2	2	0	5
WEST JAINTIA HILLS	0	3	0	2	0	5
<b>ODISHA</b>	<b>4</b>	<b>60</b>	<b>11</b>	<b>54</b>	<b>24</b>	<b>153</b>
ANGUL	0	2	0	3	0	5
BALANGIR	0	1	1	2	1	5
BALASORE	0	2	0	2	1	5
BARGARH	0	2	0	2	1	5
BHADRAK	0	2	0	2	1	5
BOUDH	0	3	0	2	0	5
CUTTACK	0	3	1	0	1	5
DEOGARH	0	3	1	1	0	5
DHENKANAL	1	1	1	1	1	5
GAJAPATI	0	1	0	4	0	5
GANJAM	0	2	1	1	1	5
JAGATSinghapur	1	3	0	1	0	5
JAJPUR	1	4	1	2	2	10
JHARSUGUDA	0	2	0	3	1	6
KALAHANDI	0	2	0	3	0	5
KANDHAMAL	0	2	0	2	1	5
KENDRAPARA	1	2	0	1	1	5
KENDUJHAR	0	2	0	2	1	5
KHORDHA	0	1	1	2	1	5
KORAPUT	0	2	1	0	2	5
MALKANGIRI	0	2	1	0	2	5
NABARANGPUR	0	1	0	3	1	5
NAYAGARH	0	3	0	1	1	5

## FSSAI MILK PRODUCT SURVEY- 2020



State/UT and Non Metro Districts	Chhena	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
NUAPADA	0	3	1	0	1	5
PURI	0	2	0	2	1	5
RAYAGADA	0	2	0	4	0	6
SAMBALPUR	0	1	1	2	1	5
SONEPUR	0	1	0	3	1	5
SUNDARGARH	0	3	0	3	0	6
<b>PUNJAB</b>	<b>0</b>	<b>21</b>	<b>13</b>	<b>48</b>	<b>23</b>	<b>105</b>
AMRITSAR	0	0	1	3	1	5
BARNALA	0	1	1	3	1	6
BATHINDA	0	2	0	2	1	5
FARIDKOT	0	0	1	1	1	3
FATEHGARH SAHIB	0	1	1	2	1	5
FAZILKA	0	0	0	2	1	3
FIROZPUR	0	0	1	0	2	3
GURDASPUR	0	1	0	4	0	5
HOSHIARPUR	0	2	0	2	1	5
JALANDHAR	0	2	1	1	1	5
KAPURTHALA	0	2	0	2	1	5
LUDHIANA	0	0	0	4	1	5
MANSA	0	1	0	4	0	5
MOGA	0	2	0	2	1	5
MUKTSAR	0	0	1	3	1	5
NAWANSHAHR(SHAHID BHAGAT SINGH NAGAR)	0	1	1	3	0	5
PATHANKOT	0	2	1	1	1	5
PATIALA	0	2	0	2	1	5
RUPNAGAR	0	1	1	1	2	5
SAHIBZADA AJIT SINGH NAGAR	0	0	2	0	3	5
SANGRUR	0	0	0	4	1	5
TARN TARAN	0	1	1	2	1	5
<b>RAJASTHAN</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>10</b>	<b>1</b>	<b>20</b>
AJMER	0	0	2	2	1	5
BARMER	0	1	0	6	0	7
BHARATPUR	0	0	6	0	0	6
JHUNJHUNUN	0	0	0	2	0	2
<b>SIKKIM</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>10</b>	<b>4</b>	<b>19</b>
EAST SIKKIM	0	2	0	2	1	5
NORTH SIKKIM	0	1	0	3	1	5
SOUTH SIKKIM	0	0	0	5	1	6
WEST SIKKIM	0	2	0	0	1	3
<b>TAMIL NADU</b>	<b>0</b>	<b>35</b>	<b>19</b>	<b>89</b>	<b>32</b>	<b>175</b>

## FSSAI MILK PRODUCT SURVEY- 2020



State/UT and Non Metro Districts	Chhena	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
ARIYALUR	0	0	0	3	2	5
CHENGALPATTU	0	1	0	4	0	5
COIMBATORE	0	1	1	1	1	4
DHARMAPURI	0	1	1	2	1	5
DINDIGUL	0	1	1	1	3	6
ERODE	0	1	3	1	0	5
KALLAKURICHI	0	1	0	3	1	5
KANCHIPURAM	0	2	0	2	0	4
KANYAKUMARI	0	2	0	3	1	6
KARUR	0	1	0	2	2	5
KRISHNAGIRI	0	1	1	1	1	4
MADURAI	0	1	0	3	2	6
NAGAPATTINAM	0	1	0	4	0	5
NAMAKKAL	0	0	1	1	3	5
PERAMBALUR	0	1	0	4	0	5
PUDUKKOTTAI	0	1	0	1	1	3
RAMANATHAPURAM	0	2	0	3	0	5
RANIPET	0	1	0	4	0	5
SALEM	0	1	1	1	0	3
SIVAGANGA	0	0	1	3	1	5
TENKASI	0	1	0	3	1	5
THANJAVUR	0	0	0	3	1	4
THE NILGIRIS	0	1	1	1	2	5
THENI	0	0	1	4	1	6
THOOTHUKKUDI	0	1	0	3	1	5
TIRUCHIRAPPALLI	0	1	0	4	0	5
TIRUNELVELI	0	1	1	3	0	5
TIRUPATHUR	0	1	1	2	1	5
TIRUPPUR	0	1	0	3	1	5
TIRUVALLUR	0	2	1	1	1	5
TIRUVANNAMALAI	0	1	2	1	0	4
TIRUVARUR	0	0	1	3	1	5
VELLORE	0	1	0	3	1	5
VILUPPURAM	0	1	1	6	2	10
VIRUDHUNAGAR	0	3	0	2	0	5
<b>TELANGANA</b>	<b>0</b>	<b>34</b>	<b>5</b>	<b>137</b>	<b>7</b>	<b>183</b>
ADILABAD	0	0	0	5	0	5
BHADRADRIKOTHAGUDEM	0	0	0	5	0	5
HYDERABAD	0	5	0	20	0	25
JAGTIAL	0	1	1	3	1	6
JANGAON	0	1	1	3	0	5
JAYASHANKAR	0	0	0	5	0	5

## FSSAI MILK PRODUCT SURVEY- 2020



State/UT and Non Metro Districts	Chhena	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
BHOOPALPALLY						
JOGULAMBA GADWAL	0	0	0	5	0	5
KAMAREDDY	0	2	0	3	0	5
KARIMNAGAR	0	2	0	2	1	5
KHAMMAM	0	0	0	5	0	5
KOMARAMBHEEM ASIFABAD	0	0	0	5	0	5
MAHBUBNAGAR	0	4	0	1	0	5
MANCHERIAL	0	2	0	3	0	5
MEDAK	0	2	0	6	0	8
MEDCHAL	0	3	0	2	0	5
NAGARKURNOOL	0	1	0	5	0	6
NALGONDA	0	2	0	5	1	8
NIRMAL	0	1	0	4	0	5
NIZAMABAD	0	1	0	4	0	5
PEDDAPALLI	0	1	0	4	1	6
RAJANNA SIRCILLA	0	1	0	3	1	5
RANGAREDDY	0	2	0	3	0	5
SANGAREDDY	0	1	0	7	0	8
SIDDIPET	0	0	1	5	0	6
SURYAPET	0	0	1	4	0	5
VIKARABAD	0	2	0	3	0	5
WANAPARTHY	0	0	1	2	2	5
WARANGAL (RURAL)	0	0	0	5	0	5
WARANGAL (URBAN)	0	0	0	5	0	5
YADADRIBHUVANAGIRI	0	0	0	5	0	5
<b>UTTAR PRADESH</b>	<b>31</b>	<b>66</b>	<b>81</b>	<b>103</b>	<b>88</b>	<b>369</b>
AGRA	0	1	2	1	1	5
ALIGARH	0	1	2	1	1	5
ALLAHABAD	1	1	0	2	1	5
AMBEDKAR NAGAR	0	0	1	3	1	5
AMETHI (CHATRAPATI SAHUJI MAHRAJ NAGAR)	1	0	2	0	2	5
AMROHA (J.P. NAGAR)	0	2	0	2	1	5
AURAIYA	0	2	1	1	1	5
AZAMGARH	0	2	0	2	1	5
BAGHPAT	0	1	1	1	1	4
BAHRAICH	1	0	1	2	1	5
BALLIA	0	2	1	1	1	5
BALRAMPUR	0	1	1	2	1	5
BANDA	0	1	2	1	1	5
BARABANKI	0	1	1	2	1	5

## FSSAI MILK PRODUCT SURVEY- 2020



State/UT and Non Metro Districts	Chhena	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
BAREILLY	0	1	1	2	1	5
BASTI	1	0	3	0	1	5
BIJNOR	0	1	1	2	1	5
BUDAUN	0	1	0	3	1	5
BULANDSHAHAR	0	2	0	2	1	5
CHANDAULI	1	0	1	2	1	5
CHITRAKOOT	2	0	1	0	2	5
DEORIA	0	1	1	2	1	5
ETAH	2	0	2	0	2	6
ETAWAH	1	0	1	2	1	5
FAIZABAD	0	1	1	2	1	5
FARRUKHABAD	0	0	1	3	1	5
FATEHPUR	0	1	1	2	1	5
FIROZABAD	0	1	2	0	2	5
GAUTAM BUDDHANAGAR	0	1	1	2	1	5
GHAZIABAD	0	2	0	2	1	5
GHAZIPUR	0	1	1	2	1	5
GONDA	0	1	1	2	1	5
GORAKHPUR	1	1	1	1	1	5
HAMIRPUR	0	1	1	2	1	5
HAPUR	0	1	1	2	1	5
HARDOI	2	0	1	0	2	5
HATHRAS	0	1	2	0	2	5
JALAUN	2	0	1	0	2	5
JAUNPUR	1	1	1	1	1	5
JHANSI	2	0	1	0	2	5
KANNAUJ	1	0	1	0	1	3
KANPUR DEHAT	1	1	2	0	1	5
KANPUR NAGAR	0	1	0	4	0	5
KANSHIRAMNAGAR	0	2	1	1	1	5
KAUSHAMBI	1	0	0	3	1	5
KHERI	0	0	1	0	0	1
KUSHINAGAR(PADRAUNA)	1	1	0	2	1	5
LAKHIMPUR KHERI	1	0	1	0	3	5
LALITPUR	0	1	2	0	2	5
LUCKNOW	0	1	2	0	1	4
MAHARAJGANJ	1	1	1	1	1	5
MAHOBA	0	0	3	1	1	5
MAINPURI	0	1	1	2	1	5
MATHURA	1	0	1	0	3	5
MAU	0	1	0	3	1	5
MEERUT	1	1	1	1	1	5

## FSSAI MILK PRODUCT SURVEY- 2020



State/UT and Non Metro Districts	Chhena	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
MIRZAPUR	1	1	1	1	1	5
MORADABAD	0	2	3	0	0	5
MUZAFFARNAGAR	0	1	1	2	1	5
PILIBHIT	0	1	2	1	1	5
PRATAPGARH	1	1	1	1	1	5
RAE BARELI	1	0	2	0	2	5
RAMPUR	1	1	1	0	2	5
SAHARANPUR	0	2	1	1	1	5
SAMBHAL (BHIM NAGAR)	0	1	1	2	1	5
SANT KABIR NAGAR	0	2	1	1	1	5
SANT RAVIDAS NAGAR (BHADOHI)	0	1	1	2	1	5
SHAHJAHANPUR	0	1	1	2	1	5
SHAMALI(PRABUDDH NAGAR)	0	0	1	0	0	1
SHRAVASTI	0	1	0	1	2	4
SIDDHARTH NAGAR	0	1	1	2	1	5
SITAPUR	0	1	1	2	1	5
SONBHADRA	0	2	1	1	1	5
SULTANPUR	0	1	0	4	1	6
UNNAO	1	0	0	3	1	5
VARANASI	0	1	1	2	1	5
<b>UTTARAKHAND</b>	<b>0</b>	<b>20</b>	<b>7</b>	<b>23</b>	<b>13</b>	<b>63</b>
ALMORA	0	1	1	1	2	5
BAGESHWAR	0	1	0	2	2	5
CHAMOLI	0	2	0	2	1	5
CHAMPAWAT	0	1	0	2	0	3
DEHRADUN	0	1	1	2	1	5
HARDWAR	0	2	0	2	0	4
NAINITAL	0	2	0	2	1	5
PAURI GARHWAL	0	2	0	3	1	6
PITHORAGARH	0	1	2	1	1	5
RUDRAPRAYAG	0	2	0	2	1	5
TEHRI GARHWAL	0	3	1	0	1	5
UDHAM SINGH NAGAR	0	1	2	1	1	5
UTTARKASHI	0	1	0	3	1	5
<b>Grand Total</b>	<b>76</b>	<b>573</b>	<b>353</b>	<b>1210</b>	<b>498</b>	<b>2710</b>

Name of Metro City	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
Bangalore, KARNATAKA	9	2	15	4	30

## FSSAI MILK PRODUCT SURVEY- 2020



Mumbai, MAHARASHTRA	9	4	13	5	31
Chennai, TAMIL NADU	5	4	18	3	30
<b>Grand Total</b>	<b>23</b>	<b>10</b>	<b>46</b>	<b>12</b>	<b>91</b>

Note: No samples were collected from Delhi and Kolkata

## FSSAI MILK PRODUCT SURVEY- 2020



### ANNEXURE IV: STATE-WISE & PRODUCT-WISE SAMPLE COLLECTION BREAK-UP

S. No.	State/ UT	Chhena	Chhena based Dessert	Khoa	Khoa Based Dessert	Paneer	Grand Total
1	ANDAMAN AND NICOBAR ISLANDS	2	0	2	0	1	5
2	ANDHRA PRADESH	0	17	7	41	7	72
3	BIHAR	18	32	45	55	36	186
4	CHANDIGARH	0	1	0	3	1	5
5	CHHATTISGARH	4	33	15	51	28	131
6	DADRA & NAGAR HAVELI	0	1	0	3	1	5
7	DAMAN AND DIU	0	1	0	6	3	10
8	GOA	0	0	0	9	1	10
9	GUJARAT	0	36	13	81	36	166
10	HARYANA	4	20	23	37	21	105
11	HIMACHAL PRADESH	0	11	3	23	8	45
12	JAMMU AND KASHMIR	0	14	5	35	19	73
13	JHARKHAND	2	29	9	41	21	102
14	KARNATAKA	0	37	12	96	21	166
15	KERALA	0	9	1	42	18	70
16	MADHYA PRADESH	8	35	50	108	44	245
17	MAHARASHTRA	1	40	27	97	30	195
18	MANIPUR	2	14	1	24	12	53
19	MEGHALAYA	0	19	2	12	7	40
20	ODISHA	4	60	11	54	24	153
21	PUNJAB	0	21	13	48	23	105
22	RAJASTHAN	0	1	8	10	1	20
23	SIKKIM	0	5	0	10	4	19
24	TAMIL NADU	0	40	23	107	35	205
25	TELANGANA	0	34	5	137	7	183
26	UTTAR PRADESH	31	66	81	103	88	369
27	UTTARAKHAND	0	20	7	23	13	63
	<b>Grand Total</b>	<b>76</b>	<b>596</b>	<b>363</b>	<b>1256</b>	<b>510</b>	<b>2801</b>

**TEST REQUEST FORM**

(To be attached with each sample)

1. Sample Code:
2. Date of Sample Collection:
3. Location of sampling with address:
4. Name of Sample:
5. Brand Name (please indicate if it is loose):
6. Batch No. (In case of packed sample):
7. Manufacture Date (MM/DD/YYYY):
8. Best Before Date (MM/DD/YYYY):
9. Name of the Lab to which dispatched:
10. Date of dispatch to the State Food Testing Lab/FSSAI selected Lab:

Name and Signature of Food Safety Officer (FSO) with Stamp

**ANNEXURE VI: LIST OF SAMPLES NOT TAKEN FOR ANALYSIS (OUT-OF-SCOPE SAMPLES)**

<b>Product</b>	<b>Number of samples</b>
Ghee	2
Butter	5
Soan Papdi	1
Dairy Whitener	2
Instant Mix Gulab Jamun Powder	1
Milk	8
Tofu Paneer	1
Cheese Spread Plain	1
Cheese	3
Baby Milk	1
Batter	1
Pasteurised Table Butter	1
Curd	1
Badam Milk	1
Fruit Yogurt	1
<b>Total</b>	<b>30</b>

## FSSAI MILK PRODUCT SURVEY- 2020

### ANNEXURE VII: DISTRICT-WISE NUMBER OF SAMPLES ANALYSED, COMPLIANT, NON-COMPLIANT, % COMPLIANCE and % NON-COMPLIANCE

S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
	<b>ANDAMAN AND NICOBAR ISLANDS</b>	<b>5</b>	<b>0</b>	<b>5</b>	<b>0.0%</b>	<b>100.0%</b>
1	SOUTH ANDAMAN	5	0	5	0.0%	100.0%
	<b>ANDHRA PRADESH</b>	<b>72</b>	<b>50</b>	<b>22</b>	<b>69.4%</b>	<b>30.6%</b>
2	ANANTAPUR	6	5	1	83.3%	16.7%
3	CHITTOOR	5	5	0	100.0%	0.0%
4	EAST GODAVARI	4	3	1	75.0%	25.0%
5	GUNTUR	6	2	4	33.3%	66.7%
6	KRISHNA	5	4	1	80.0%	20.0%
7	KURNOOL	8	4	4	50.0%	50.0%
8	PRAKASAM	7	1	6	14.3%	85.7%
9	SRI POTTI SRIRAMULU NELLORE	5	4	1	80.0%	20.0%
10	SRIKAKULAM	5	3	2	60.0%	40.0%
11	VISAKHAPATNAM	5	5	0	100.0%	0.0%
12	VIZIANAGARAM	5	3	2	60.0%	40.0%
13	WEST GODAVARI	5	5	0	100.0%	0.0%
14	YSR DISTRICT, KADAPA (CUDDAPAH)	6	6	0	100.0%	0.0%
	<b>BIHAR</b>	<b>186</b>	<b>104</b>	<b>82</b>	<b>55.9%</b>	<b>44.1%</b>
15	ARARIA	5	5	0	100.0%	0.0%
16	ARWAL	5	3	2	60.0%	40.0%
17	AURANGABAD	5	2	3	40.0%	60.0%
18	BANKA	5	1	4	20.0%	80.0%
19	BEGUSARAI	5	1	4	20.0%	80.0%
20	BHAGALPUR	5	2	3	40.0%	60.0%
21	BHOJPUR	5	5	0	100.0%	0.0%
22	BUXAR	5	2	3	40.0%	60.0%
23	GAYA	5	4	1	80.0%	20.0%
24	GOPALGANJ	5	2	3	40.0%	60.0%
25	JAMUI	5	2	3	40.0%	60.0%
26	JEHANABAD	5	2	3	40.0%	60.0%
27	KAIMUR (BHABUA)	5	2	3	40.0%	60.0%
28	KATIHAR	5	4	1	80.0%	20.0%
29	KHAGARIA	5	4	1	80.0%	20.0%
30	KISHANGANJ	5	3	2	60.0%	40.0%
31	LAKHISARAI	5	2	3	40.0%	60.0%

## FSSAI MILK PRODUCT SURVEY- 2020



S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
32	MADHEPURA	5	3	2	60.0%	40.0%
33	MUNGER (MONGHYR)	5	2	3	40.0%	60.0%
34	MUZAFFARPUR	9	8	1	88.9%	11.1%
35	NALANDA	5	2	3	40.0%	60.0%
36	NAWADA	5	4	1	80.0%	20.0%
37	PASHCHIM CHAMPARAN	5	3	2	60.0%	40.0%
38	PATNA	7	5	2	71.4%	28.6%
39	PURBA CHAMPARAN (MOTIHARI)	5	1	4	20.0%	80.0%
40	PURNIA (PURNEA)	5	3	2	60.0%	40.0%
41	ROHTAS	5	2	3	40.0%	60.0%
42	SAHARSA	5	2	3	40.0%	60.0%
43	SAMASTIPUR	5	3	2	60.0%	40.0%
44	SARAN	5	1	4	20.0%	80.0%
45	SHEIKHPURA	5	4	1	80.0%	20.0%
46	SHEOHAR	5	3	2	60.0%	40.0%
47	SITAMARHI	5	1	4	20.0%	80.0%
48	SIWAN	5	2	3	40.0%	60.0%
49	SUPAUL	5	4	1	80.0%	20.0%
50	VAISHALI	5	5	0	100.0%	0.0%
	<b>CHANDIGARH</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>60.0%</b>	<b>40.0%</b>
51	CHANDIGARH	5	3	2	60.0%	40.0%
	<b>CHHATTISGARH</b>	<b>131</b>	<b>86</b>	<b>45</b>	<b>65.6%</b>	<b>34.4%</b>
52	BALOD	5	3	2	60.0%	40.0%
53	BALODA BAZAR	2	1	1	50.0%	50.0%
54	BALRAMPUR	5	4	1	80.0%	20.0%
55	BASTAR	5	5	0	100.0%	0.0%
56	BEMETARA	5	3	2	60.0%	40.0%
57	BIJAPUR	5	4	1	80.0%	20.0%
58	BILASPUR	5	1	4	20.0%	80.0%
59	DANTEWADA (SOUTH BASTAR)	5	2	3	40.0%	60.0%
60	DHAMTARI	5	3	2	60.0%	40.0%
61	DURG	4	2	2	50.0%	50.0%
62	GARIYABAND	5	2	3	40.0%	60.0%
63	JANJGIR-CHAMPA	5	4	1	80.0%	20.0%
64	JASHPUR	5	3	2	60.0%	40.0%
65	KABIRDHAM (KAWARDHA)	5	3	2	60.0%	40.0%

## FSSAI MILK PRODUCT SURVEY- 2020



S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
66	KANKER (NORTH BASTAR)	5	4	1	80.0%	20.0%
67	KONDAGAON	5	5	0	100.0%	0.0%
68	KORBA	5	3	2	60.0%	40.0%
69	KORIYA	5	2	3	40.0%	60.0%
70	MAHASAMUND	5	4	1	80.0%	20.0%
71	MUNGELI	5	4	1	80.0%	20.0%
72	NARAYANPUR	5	4	1	80.0%	20.0%
73	RAIGARH	5	4	1	80.0%	20.0%
74	RAIPUR	5	2	3	40.0%	60.0%
75	RAJNANDGAON	5	3	2	60.0%	40.0%
76	SUKMA	5	3	2	60.0%	40.0%
77	SURAJPUR	5	5	0	100.0%	0.0%
78	SURGUJA	5	3	2	60.0%	40.0%
	<b>DADRA &amp; NAGAR HAVELI</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>60.0%</b>	<b>40.0%</b>
79	DADRA & NAGAR HAVELI	5	3	2	60.0%	40.0%
	<b>DAMAN AND DIU</b>	<b>10</b>	<b>3</b>	<b>7</b>	<b>30.0%</b>	<b>70.0%</b>
80	DAMAN	5	1	4	20.0%	80.0%
81	DIU	5	2	3	40.0%	60.0%
	<b>GOA</b>	<b>10</b>	<b>3</b>	<b>7</b>	<b>30.0%</b>	<b>70.0%</b>
82	NORTH GOA	5	2	3	40.0%	60.0%
83	SOUTH GOA	5	1	4	20.0%	80.0%
	<b>GUJARAT</b>	<b>166</b>	<b>86</b>	<b>80</b>	<b>51.8%</b>	<b>48.2%</b>
84	AHMADABAD	5	2	3	40.0%	60.0%
85	AMRELI	5	2	3	40.0%	60.0%
86	ANAND	5	3	2	60.0%	40.0%
87	ARAVALLI	5	2	3	40.0%	60.0%
88	BANAS KANTHA	5	3	2	60.0%	40.0%
89	BHARUCH	5	3	2	60.0%	40.0%
90	BHAVNAGAR	5	3	2	60.0%	40.0%
91	BOTAD	5	2	3	40.0%	60.0%
92	CHHOTA UDEPUR	5	3	2	60.0%	40.0%
93	DAHOD	5	2	3	40.0%	60.0%
94	DEVBHOO MI DWARKA	5	3	2	60.0%	40.0%
95	GANDHINAGAR	5	2	3	40.0%	60.0%
96	GIR SOMNATH	5	3	2	60.0%	40.0%
97	JAMNAGAR	5	4	1	80.0%	20.0%
98	JUNAGADH	5	4	1	80.0%	20.0%

## FSSAI MILK PRODUCT SURVEY- 2020



S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
99	KACHCHH	5	3	2	60.0%	40.0%
100	KHEDA (NADIAD)	5	2	3	40.0%	60.0%
101	MAHESANA	5	2	3	40.0%	60.0%
102	MAHISAGAR	5	2	3	40.0%	60.0%
103	MORBI	6	5	1	83.3%	16.7%
104	NARMADA (RAJPIPLA)	5	1	4	20.0%	80.0%
105	NAVSARI	5	1	4	20.0%	80.0%
106	PANCH MAHALS	5	3	2	60.0%	40.0%
107	PATAN	5	5	0	100.0%	0.0%
108	PORBANDAR	5	2	3	40.0%	60.0%
109	RAJKOT	10	4	6	40.0%	60.0%
110	SABAR KANTHA	5	4	1	80.0%	20.0%
111	SURAT	5	2	3	40.0%	60.0%
112	SURENDRANAGAR	5	4	1	80.0%	20.0%
113	TAPI (VYARA)	5	0	5	0.0%	100.0%
114	VADODARA	5	1	4	20.0%	80.0%
115	VALSAD	5	4	1	80.0%	20.0%
	<b>HARYANA</b>	<b>105</b>	<b>64</b>	<b>41</b>	<b>61.0%</b>	<b>39.0%</b>
116	AMBALA	5	3	2	60.0%	40.0%
117	CHARKHI DADRI	5	1	4	20.0%	80.0%
118	FARIDABAD	5	4	1	80.0%	20.0%
119	FATEHABAD	5	2	3	40.0%	60.0%
120	GURUGRAM (GURGAON)	5	4	1	80.0%	20.0%
121	HISAR	5	5	0	100.0%	0.0%
122	JHAJJAR	5	2	3	40.0%	60.0%
123	JIND	5	1	4	20.0%	80.0%
124	KAITHAL	5	2	3	40.0%	60.0%
125	KARNAL	5	5	0	100.0%	0.0%
126	KURUKSHETRA	5	1	4	20.0%	80.0%
127	MAHENDRAGARH	5	4	1	80.0%	20.0%
128	NUH	5	5	0	100.0%	0.0%
129	PALWAL	5	5	0	100.0%	0.0%
130	PANCHKULA	5	5	0	100.0%	0.0%
131	PANIPAT	5	4	1	80.0%	20.0%
132	REWARI	5	1	4	20.0%	80.0%
133	ROHTAK	5	3	2	60.0%	40.0%
134	SIRSA	5	0	5	0.0%	100.0%
135	SONIPAT	5	2	3	40.0%	60.0%
136	YAMUNANAGAR	5	5	0	100.0%	0.0%

## FSSAI MILK PRODUCT SURVEY- 2020



S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
	<b>HIMACHAL PRADESH</b>	<b>45</b>	<b>35</b>	<b>10</b>	<b>77.8%</b>	<b>22.2%</b>
137	BILASPUR	5	5	0	100.0%	0.0%
138	CHAMBA	5	4	1	80.0%	20.0%
139	HAMIRPUR	5	4	1	80.0%	20.0%
140	KANGRA	6	6	0	100.0%	0.0%
141	KULLU	5	2	3	40.0%	60.0%
142	MANDI	4	4	0	100.0%	0.0%
143	SHIMLA	5	4	1	80.0%	20.0%
144	SOLAN	5	2	3	40.0%	60.0%
145	UNA	5	4	1	80.0%	20.0%
	<b>JAMMU AND KASHMIR</b>	<b>73</b>	<b>48</b>	<b>25</b>	<b>65.8%</b>	<b>34.2%</b>
146	ANANTNAG	5	3	2	60.0%	40.0%
147	BANDIPORE	5	1	4	20.0%	80.0%
148	BARAMULLA	5	4	1	80.0%	20.0%
149	BUDGAM	5	3	2	60.0%	40.0%
150	DODA	5	4	1	80.0%	20.0%
151	GANDERBAL	8	5	3	62.5%	37.5%
152	KISHTWAR	5	5	0	100.0%	0.0%
153	KULGAM	5	4	1	80.0%	20.0%
154	KUPWARA	5	3	2	60.0%	40.0%
155	PULWAMA	5	2	3	40.0%	60.0%
156	RAMBAN	5	4	1	80.0%	20.0%
157	SHOPIAN	5	4	1	80.0%	20.0%
158	SRINAGAR	5	4	1	80.0%	20.0%
159	UDHAMPUR	5	2	3	40.0%	60.0%
	<b>JHARKHAND</b>	<b>102</b>	<b>51</b>	<b>51</b>	<b>50.0%</b>	<b>50.0%</b>
160	BOKARO	5	3	2	60.0%	40.0%
161	CHATRA	5	3	2	60.0%	40.0%
162	DEOGHAR	5	3	2	60.0%	40.0%
163	DHANBAD	5	3	2	60.0%	40.0%
164	DUMKA	5	2	3	40.0%	60.0%
165	GIRIDIH	7	2	5	28.6%	71.4%
166	GODDA	5	4	1	80.0%	20.0%
167	HAZARIBAGH	5	3	2	60.0%	40.0%
168	JAMTARA	5	1	4	20.0%	80.0%
169	KODERMA	5	3	2	60.0%	40.0%
170	LOHARDAGA	5	1	4	20.0%	80.0%
171	PAKUR	5	3	2	60.0%	40.0%
172	PALAMU	5	3	2	60.0%	40.0%

## FSSAI MILK PRODUCT SURVEY- 2020



S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
173	PASHCHIMI SINGHBHUM	5	2	3	40.0%	60.0%
174	PURBI SINGHBHUM	5	1	4	20.0%	80.0%
175	RAMGARH	5	3	2	60.0%	40.0%
176	RANCHI	5	3	2	60.0%	40.0%
177	SAHIBGANJ	5	2	3	40.0%	60.0%
178	SARAIKELA-KHARSWANA	5	3	2	60.0%	40.0%
179	SIMDEGA	5	3	2	60.0%	40.0%
	<b>KARNATAKA</b>	<b>166</b>	<b>119</b>	<b>47</b>	<b>71.7%</b>	<b>28.3%</b>
180	BAGALKOT	5	4	1	80.0%	20.0%
181	Bangalore	30	17	13	56.7%	43.3%
182	BELGAUM	5	5	0	100.0%	0.0%
183	BELLARY	5	3	2	60.0%	40.0%
184	BIDAR	5	2	3	40.0%	60.0%
185	BIJAPUR	5	4	1	80.0%	20.0%
186	CHAMARAJANAGAR	5	4	1	80.0%	20.0%
187	CHIKKABALLAPURA	5	4	1	80.0%	20.0%
188	CHIKMAGALUR	5	4	1	80.0%	20.0%
189	CHITRADURGA	4	3	1	75.0%	25.0%
190	DAKSHINA KANNADA	5	3	2	60.0%	40.0%
191	DAVANAGERE	4	2	2	50.0%	50.0%
192	DHARWAD	5	3	2	60.0%	40.0%
193	GADAG	5	3	2	60.0%	40.0%
194	GULBARGA	4	3	1	75.0%	25.0%
195	HASSAN	5	3	2	60.0%	40.0%
196	HAVERI	5	4	1	80.0%	20.0%
197	KODAGU	6	5	1	83.3%	16.7%
198	KOLAR	5	4	1	80.0%	20.0%
199	KOPPAL	4	3	1	75.0%	25.0%
200	MANDYA	4	4	0	100.0%	0.0%
201	MYSORE	5	5	0	100.0%	0.0%
202	RAICHUR	5	4	1	80.0%	20.0%
203	RAMANAGARA	5	2	3	40.0%	60.0%
204	SHIMOGA	5	4	1	80.0%	20.0%
205	TUMKUR	5	5	0	100.0%	0.0%
206	UDUPI	5	2	3	40.0%	60.0%
207	UTTARA KANNADA	5	5	0	100.0%	0.0%
208	YADGIR	5	5	0	100.0%	0.0%
	<b>KERALA</b>	<b>70</b>	<b>50</b>	<b>20</b>	<b>71.4%</b>	<b>28.6%</b>

## FSSAI MILK PRODUCT SURVEY- 2020



S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
209	ALAPPUZHA	5	3	2	60.0%	40.0%
210	ERNAKULAM	5	5	0	100.0%	0.0%
211	IDUKKI	5	4	1	80.0%	20.0%
212	KANNUR	5	5	0	100.0%	0.0%
213	KASARAGOD	5	5	0	100.0%	0.0%
214	KOLLAM	5	4	1	80.0%	20.0%
215	KOTTAYAM	5	3	2	60.0%	40.0%
216	KOZHIKODE	5	2	3	40.0%	60.0%
217	MALAPPURAM	5	4	1	80.0%	20.0%
218	PALAKKAD	5	3	2	60.0%	40.0%
219	PATHANAMTHITTA	5	4	1	80.0%	20.0%
220	THIRUVANANTHAPURAM	5	3	2	60.0%	40.0%
221	THRISSUR	5	3	2	60.0%	40.0%
222	WAYANAD	5	2	3	40.0%	60.0%
	<b>MADHYA PRADESH</b>	<b>245</b>	<b>89</b>	<b>156</b>	<b>36.3%</b>	<b>63.7%</b>
223	AGAR MALWA	4	0	4	0.0%	100.0%
224	ALIRAJPUR	5	3	2	60.0%	40.0%
225	ANUPPUR	5	3	2	60.0%	40.0%
226	ASHOKNAGAR	5	4	1	80.0%	20.0%
227	BALAGHAT	5	1	4	20.0%	80.0%
228	BARWANI	5	0	5	0.0%	100.0%
229	BETUL	5	0	5	0.0%	100.0%
230	BHIND	5	3	2	60.0%	40.0%
231	BHOPAL	5	1	4	20.0%	80.0%
232	BURHANPUR	5	1	4	20.0%	80.0%
233	CHHATARPUR	5	1	4	20.0%	80.0%
234	CHHINDWARA	5	0	5	0.0%	100.0%
235	DAMOH	5	2	3	40.0%	60.0%
236	DATIA	5	4	1	80.0%	20.0%
237	DEWAS	5	2	3	40.0%	60.0%
238	DHAR	4	2	2	50.0%	50.0%
239	GUNA	5	5	0	100.0%	0.0%
240	GWALIOR	5	2	3	40.0%	60.0%
241	HARDA	5	2	3	40.0%	60.0%
242	HOSHANGABAD	5	0	5	0.0%	100.0%
243	INDORE	5	1	4	20.0%	80.0%
244	JABALPUR	5	2	3	40.0%	60.0%
245	JHABUA	5	1	4	20.0%	80.0%
246	KATNI	5	1	4	20.0%	80.0%

## FSSAI MILK PRODUCT SURVEY- 2020



S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
247	KHANDWA (EAST NIMAR)	5	2	3	40.0%	60.0%
248	KHARGONE (WEST NIMAR)	5	2	3	40.0%	60.0%
249	MANDLA	5	2	3	40.0%	60.0%
250	MANDSAUR	5	2	3	40.0%	60.0%
251	MORENA	5	4	1	80.0%	20.0%
252	NARSINGHPUR	5	1	4	20.0%	80.0%
253	NEEMUCH	5	1	4	20.0%	80.0%
254	PANNA	5	3	2	60.0%	40.0%
255	RAISEN	5	4	1	80.0%	20.0%
256	RAJGARH	5	2	3	40.0%	60.0%
257	RATLAM	3	0	3	0.0%	100.0%
258	REWA	5	1	4	20.0%	80.0%
259	SAGAR	5	2	3	40.0%	60.0%
260	SATNA	5	2	3	40.0%	60.0%
261	SEHORE	5	2	3	40.0%	60.0%
262	SEONI	5	0	5	0.0%	100.0%
263	SHAHDOL	5	1	4	20.0%	80.0%
264	SHAJAPUR	4	0	4	0.0%	100.0%
265	SHEOPUR	5	4	1	80.0%	20.0%
266	SHIVPURI	5	3	2	60.0%	40.0%
267	SIDHI	5	2	3	40.0%	60.0%
268	SINGRAULI	5	3	2	60.0%	40.0%
269	TIKAMGARH	5	0	5	0.0%	100.0%
270	UJJAIN	5	1	4	20.0%	80.0%
271	UMARIA	5	2	3	40.0%	60.0%
272	VIDISHA	5	2	3	40.0%	60.0%
	<b>MAHARASHTRA</b>	<b>195</b>	<b>104</b>	<b>91</b>	<b>53.3%</b>	<b>46.7%</b>
273	AHMADNAGAR	6	0	6	0.0%	100.0%
274	AKOLA	5	4	1	80.0%	20.0%
275	AMRAVATI	5	3	2	60.0%	40.0%
276	AURANGABAD	5	3	2	60.0%	40.0%
277	BEED	5	3	2	60.0%	40.0%
278	BHANDARA	5	2	3	40.0%	60.0%
279	BULDANA	4	0	4	0.0%	100.0%
280	BULDHANA	1	1	0	100.0%	0.0%
281	CHANDRAPUR	5	1	4	20.0%	80.0%
282	DHULE	5	2	3	40.0%	60.0%
283	GADCHIROLI	6	6	0	100.0%	0.0%

## FSSAI MILK PRODUCT SURVEY- 2020



S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
284	GONDIYA	5	1	4	20.0%	80.0%
285	JALGAON	4	3	1	75.0%	25.0%
286	JALNA	5	4	1	80.0%	20.0%
287	KOLHAPUR	5	5	0	100.0%	0.0%
288	LATUR	5	3	2	60.0%	40.0%
289	Mumbai	31	24	7	77.4%	22.6%
290	NAGPUR	5	0	5	0.0%	100.0%
291	NANDED	5	1	4	20.0%	80.0%
292	NANDURBAR	5	2	3	40.0%	60.0%
293	NASHIK	4	0	4	0.0%	100.0%
294	OSMANABAD	5	0	5	0.0%	100.0%
295	PALGHAR	5	1	4	20.0%	80.0%
296	PARBHANI	5	2	3	40.0%	60.0%
297	PUNE	5	3	2	60.0%	40.0%
298	RAIGARH	5	4	1	80.0%	20.0%
299	RATNAGIRI	5	3	2	60.0%	40.0%
300	SANGLI	4	3	1	75.0%	25.0%
301	SATARA	5	5	0	100.0%	0.0%
302	SINDHUDURG	5	2	3	40.0%	60.0%
303	SOLAPUR	5	2	3	40.0%	60.0%
304	THANE	5	2	3	40.0%	60.0%
305	WARDHA	5	3	2	60.0%	40.0%
306	WASHIM	5	2	3	40.0%	60.0%
307	YAVATMAL	5	4	1	80.0%	20.0%
	<b>MANIPUR</b>	<b>53</b>	<b>49</b>	<b>4</b>	<b>92.5%</b>	<b>7.5%</b>
308	BISHNUPUR	6	6	0	100.0%	0.0%
309	CHANDEL	5	5	0	100.0%	0.0%
310	CHURACHANDPUR	4	3	1	75.0%	25.0%
311	IMPHAL EAST	5	5	0	100.0%	0.0%
312	IMPHAL WEST	5	5	0	100.0%	0.0%
313	KAKCHING	4	3	1	75.0%	25.0%
314	KAMJONG	5	5	0	100.0%	0.0%
315	KANGPOKPI	5	3	2	60.0%	40.0%
316	SENAPATI	3	3	0	100.0%	0.0%
317	TENGNOUNPAL	2	2	0	100.0%	0.0%
318	THOUBAL	5	5	0	100.0%	0.0%
319	UKHRUL	4	4	0	100.0%	0.0%
	<b>MEGHALAYA</b>	<b>40</b>	<b>31</b>	<b>9</b>	<b>77.5%</b>	<b>22.5%</b>
320	EAST GARO HILLS	2	2	0	100.0%	0.0%
321	EAST JAINTIA HILLS	5	5	0	100.0%	0.0%

## FSSAI MILK PRODUCT SURVEY- 2020



S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
322	NORTH GARO HILLS	3	3	0	100.0%	0.0%
323	RI BHOI	5	3	2	60.0%	40.0%
324	SOUTH GARO HILLS	5	5	0	100.0%	0.0%
325	SOUTH WEST GARO HILLS	5	3	2	60.0%	40.0%
326	SOUTH WEST KHASI HILLS	5	5	0	100.0%	0.0%
327	WEST GARO HILLS	5	0	5	0.0%	100.0%
328	WEST JAINZIA HILLS	5	5	0	100.0%	0.0%
	<b>ODISHA</b>	<b>153</b>	<b>87</b>	<b>66</b>	<b>56.9%</b>	<b>43.1%</b>
329	ANGUL	5	4	1	80.0%	20.0%
330	BALANGIR	5	2	3	40.0%	60.0%
331	BALASORE	5	1	4	20.0%	80.0%
332	BARGARH	5	2	3	40.0%	60.0%
333	BHADRAK	5	1	4	20.0%	80.0%
334	BOUDH	5	3	2	60.0%	40.0%
335	CUTTACK	5	3	2	60.0%	40.0%
336	DEOGARH	5	3	2	60.0%	40.0%
337	DHENKANAL	5	4	1	80.0%	20.0%
338	GAJAPATI	5	3	2	60.0%	40.0%
339	GANJAM	5	4	1	80.0%	20.0%
340	JAGATSINGHAPUR	5	5	0	100.0%	0.0%
341	JAJPUR	10	5	5	50.0%	50.0%
342	JHARSUGUDA	6	3	3	50.0%	50.0%
343	KALAHANDI	5	2	3	40.0%	60.0%
344	KANDHAMAL	5	3	2	60.0%	40.0%
345	KENDRAPARA	5	5	0	100.0%	0.0%
346	KENDUJHAR	5	1	4	20.0%	80.0%
347	Khordha	5	4	1	80.0%	20.0%
348	KORAPUT	5	3	2	60.0%	40.0%
349	MALKANGIRI	5	2	3	40.0%	60.0%
350	NABARANGPUR	5	3	2	60.0%	40.0%
351	NAYAGARH	5	2	3	40.0%	60.0%
352	NUAPADA	5	4	1	80.0%	20.0%
353	PURI	5	3	2	60.0%	40.0%
354	RAYAGADA	6	2	4	33.3%	66.7%
355	SAMBALPUR	5	4	1	80.0%	20.0%
356	SONEPUR	5	2	3	40.0%	60.0%
357	SUNDARGARH	6	4	2	66.7%	33.3%
	<b>PUNJAB</b>	<b>105</b>	<b>47</b>	<b>58</b>	<b>44.8%</b>	<b>55.2%</b>

## FSSAI MILK PRODUCT SURVEY- 2020



S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
358	AMRITSAR	5	0	5	0.0%	100.0%
359	BARNALA	6	4	2	66.7%	33.3%
360	BATHINDA	5	4	1	80.0%	20.0%
361	FARIDKOT	3	1	2	33.3%	66.7%
362	FATEHGARH SAHIB	5	3	2	60.0%	40.0%
363	FAZILKA	3	1	2	33.3%	66.7%
364	FIROZPUR	3	1	2	33.3%	66.7%
365	GURDASPUR	5	5	0	100.0%	0.0%
366	HOSHIARPUR	5	2	3	40.0%	60.0%
367	JALANDHAR	5	2	3	40.0%	60.0%
368	KAPURTHALA	5	3	2	60.0%	40.0%
369	LUDHIANA	5	4	1	80.0%	20.0%
370	MANSA	5	2	3	40.0%	60.0%
371	MOGA	5	3	2	60.0%	40.0%
372	MUKTSAR	5	1	4	20.0%	80.0%
373	NAWANSHAHR (SHAHID BHAGAT SINGH NAGAR)	5	3	2	60.0%	40.0%
374	PATHANKOT	5	1	4	20.0%	80.0%
375	PATIALA	5	1	4	20.0%	80.0%
376	RUPNAGAR	5	0	5	0.0%	100.0%
377	SAHIBZADA AJIT SINGH NAGAR	5	1	4	20.0%	80.0%
378	SANGRUR	5	2	3	40.0%	60.0%
379	TARN TARAN	5	3	2	60.0%	40.0%
	<b>RAJASTHAN</b>	<b>20</b>	<b>10</b>	<b>10</b>	<b>50.0%</b>	<b>50.0%</b>
380	AJMER	5	2	3	40.0%	60.0%
381	BARMER	7	5	2	71.4%	28.6%
382	BHARATPUR	6	2	4	33.3%	66.7%
383	JHUNJHUNUN	2	1	1	50.0%	50.0%
	<b>SIKKIM</b>	<b>19</b>	<b>13</b>	<b>6</b>	<b>68.4%</b>	<b>31.6%</b>
384	EAST SIKKIM	5	2	3	40.0%	60.0%
385	NORTH SIKKIM	5	5	0	100.0%	0.0%
386	SOUTH SIKKIM	6	4	2	66.7%	33.3%
387	WEST SIKKIM	3	2	1	66.7%	33.3%
	<b>TAMIL NADU</b>	<b>205</b>	<b>132</b>	<b>73</b>	<b>64.4%</b>	<b>35.6%</b>
388	ARIYALUR	5	3	2	60.0%	40.0%
389	CHENGALPATTU	5	5	0	100.0%	0.0%
390	CHENNAI	30	23	7	76.7%	23.3%
391	COIMBATORE	4	1	3	25.0%	75.0%

## FSSAI MILK PRODUCT SURVEY- 2020



S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
392	DHARMAPURI	5	3	2	60.0%	40.0%
393	DINDIGUL	6	2	4	33.3%	66.7%
394	ERODE	5	2	3	40.0%	60.0%
395	KALLAKURICHI	5	5	0	100.0%	0.0%
396	KANCHIPURAM	4	4	0	100.0%	0.0%
397	KANYAKUMARI	6	5	1	83.3%	16.7%
398	KARUR	5	1	4	20.0%	80.0%
399	KRISHNAGIRI	4	2	2	50.0%	50.0%
400	MADURAI	6	4	2	66.7%	33.3%
401	NAGAPATTINAM	5	4	1	80.0%	20.0%
402	NAMAKKAL	5	1	4	20.0%	80.0%
403	PERAMBALUR	5	5	0	100.0%	0.0%
404	PUDUKKOTTAI	3	1	2	33.3%	66.7%
405	RAMANATHAPURAM	5	5	0	100.0%	0.0%
406	RANIPET	5	5	0	100.0%	0.0%
407	SALEM	3	2	1	66.7%	33.3%
408	SIVAGANGA	5	2	3	40.0%	60.0%
409	TENKASI	5	2	3	40.0%	60.0%
410	THANJAVUR	4	2	2	50.0%	50.0%
411	THE NILGIRIS	5	2	3	40.0%	60.0%
412	THENI	6	4	2	66.7%	33.3%
413	THOOTHUKKUDI	5	3	2	60.0%	40.0%
414	TIRUCHIRAPPALLI	5	4	1	80.0%	20.0%
415	TIRUNELVELI	5	3	2	60.0%	40.0%
416	TIRUPATHUR	5	3	2	60.0%	40.0%
417	TIRUPPUR	5	4	1	80.0%	20.0%
418	TIRUVALLUR	5	2	3	40.0%	60.0%
419	TIRUVANNAMALAI	4	2	2	50.0%	50.0%
420	TIRUVARUR	5	3	2	60.0%	40.0%
421	VELLORE	5	3	2	60.0%	40.0%
422	VILUPPURAM	10	7	3	70.0%	30.0%
423	VIRUDHUNAGAR	5	3	2	60.0%	40.0%
	<b>TELANGANA</b>	<b>183</b>	<b>148</b>	<b>35</b>	<b>80.9%</b>	<b>19.1%</b>
424	ADILABAD	5	2	3	40.0%	60.0%
425	BHADRADRI KOTHAGUDEM	5	5	0	100.0%	0.0%
426	HYDERABAD	25	23	2	92.0%	8.0%
427	JAGTIAL	6	3	3	50.0%	50.0%
428	JANGAON	5	3	2	60.0%	40.0%
429	JAYASHANKAR	5	5	0	100.0%	0.0%

## FSSAI MILK PRODUCT SURVEY- 2020



S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
	BHOOPALPALLY					
430	JOGULAMBA GADWAL	5	3	2	60.0%	40.0%
431	KAMAREDDY	5	4	1	80.0%	20.0%
432	KARIMNAGAR	5	3	2	60.0%	40.0%
433	KHAMMAM	5	3	2	60.0%	40.0%
434	KOMARAM BHEEM ASIFABAD	5	2	3	40.0%	60.0%
435	MAHBUBNAGAR	5	5	0	100.0%	0.0%
436	MANCHERIAL	5	5	0	100.0%	0.0%
437	MEDAK	8	5	3	62.5%	37.5%
438	MEDCHAL	5	5	0	100.0%	0.0%
439	NAGARKURNOOL	6	6	0	100.0%	0.0%
440	NALGONDA	8	7	1	87.5%	12.5%
441	NIRMAL	5	4	1	80.0%	20.0%
442	NIZAMABAD	5	5	0	100.0%	0.0%
443	PEDDAPALLI	6	4	2	66.7%	33.3%
444	RAJANNA SIRCILLA	5	4	1	80.0%	20.0%
445	RANGAREDDY	5	5	0	100.0%	0.0%
446	SANGAREDDY	8	6	2	75.0%	25.0%
447	SIDDIPET	6	5	1	83.3%	16.7%
448	SURYAPET	5	4	1	80.0%	20.0%
449	VIKARABAD	5	5	0	100.0%	0.0%
450	WANAPARTHY	5	3	2	60.0%	40.0%
451	WARANGAL (RURAL)	5	4	1	80.0%	20.0%
452	WARANGAL (URBAN)	5	5	0	100.0%	0.0%
453	YADADRI BHUVANAGIRI	5	5	0	100.0%	0.0%
	<b>UTTAR PRADESH</b>	<b>369</b>	<b>208</b>	<b>161</b>	<b>56.4%</b>	<b>43.6%</b>
454	AGRA	5	1	4	20.0%	80.0%
455	ALIGARH	5	1	4	20.0%	80.0%
456	ALLAHABAD	5	0	5	0.0%	100.0%
457	AMBEDKAR NAGAR	5	5	0	100.0%	0.0%
458	AMETHI (CHATRAPATI SAHUJI MAHRAJ NAGAR)	5	2	3	40.0%	60.0%
459	AMROHA (J.P. NAGAR)	5	3	2	60.0%	40.0%
460	AURAIYA	5	3	2	60.0%	40.0%
461	AZAMGARH	5	5	0	100.0%	0.0%
462	BAGHPAT	4	3	1	75.0%	25.0%

## FSSAI MILK PRODUCT SURVEY- 2020



S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
463	BAHRAICH	5	4	1	80.0%	20.0%
464	BALLIA	5	1	4	20.0%	80.0%
465	BALRAMPUR	5	0	5	0.0%	100.0%
466	BANDA	5	5	0	100.0%	0.0%
467	BARABANKI	5	4	1	80.0%	20.0%
468	BAREILLY	5	5	0	100.0%	0.0%
469	BASTI	5	1	4	20.0%	80.0%
470	BIJNOR	5	4	1	80.0%	20.0%
471	BUDAUN	5	1	4	20.0%	80.0%
472	BULANDSHAHAR	5	4	1	80.0%	20.0%
473	CHANDAULI	5	1	4	20.0%	80.0%
474	CHITRAKOOT	5	3	2	60.0%	40.0%
475	DEORIA	5	4	1	80.0%	20.0%
476	ETAH	6	3	3	50.0%	50.0%
477	ETAWAH	5	4	1	80.0%	20.0%
478	FAIZABAD	5	4	1	80.0%	20.0%
479	FARRUKHABAD	5	4	1	80.0%	20.0%
480	FATEHPUR	5	1	4	20.0%	80.0%
481	FIROZABAD	5	3	2	60.0%	40.0%
482	GAUTAM BUDDHA NAGAR	5	1	4	20.0%	80.0%
483	GHAZIABAD	5	3	2	60.0%	40.0%
484	GHAZIPUR	5	4	1	80.0%	20.0%
485	GONDA	5	4	1	80.0%	20.0%
486	GORAKHPUR	5	4	1	80.0%	20.0%
487	HAMIRPUR	5	1	4	20.0%	80.0%
488	HAPUR	5	4	1	80.0%	20.0%
489	HARDOI	5	3	2	60.0%	40.0%
490	HATHRAS	5	3	2	60.0%	40.0%
491	JALAUN	5	2	3	40.0%	60.0%
492	JAUNPUR	5	2	3	40.0%	60.0%
493	JHANSI	5	3	2	60.0%	40.0%
494	KANNAUJ	3	3	0	100.0%	0.0%
495	KANPUR DEHAT	5	2	3	40.0%	60.0%
496	KANPUR NAGAR	5	2	3	40.0%	60.0%
497	KANSHIRAM NAGAR	5	0	5	0.0%	100.0%
498	KAUSHAMBI	5	0	5	0.0%	100.0%
499	KHERI	1	0	1	0.0%	100.0%
500	KUSHINAGAR (PADRAUNA)	5	3	2	60.0%	40.0%

## FSSAI MILK PRODUCT SURVEY- 2020



S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
501	LAKHIMPUR - KHERI	5	2	3	40.0%	60.0%
502	LALITPUR	5	2	3	40.0%	60.0%
503	LUCKNOW	4	4	0	100.0%	0.0%
504	MAHARAJGANJ	5	2	3	40.0%	60.0%
505	MAHOBA	5	4	1	80.0%	20.0%
506	MAINPURI	5	4	1	80.0%	20.0%
507	MATHURA	5	1	4	20.0%	80.0%
508	MAU	5	3	2	60.0%	40.0%
509	MEERUT	5	4	1	80.0%	20.0%
510	MIRZAPUR	5	3	2	60.0%	40.0%
511	MORADABAD	5	2	3	40.0%	60.0%
512	MUZAFFARNAGAR	5	3	2	60.0%	40.0%
513	PILIBHIT	5	4	1	80.0%	20.0%
514	PRATAPGARH	5	5	0	100.0%	0.0%
515	RAE BARELI	5	1	4	20.0%	80.0%
516	RAMPUR	5	2	3	40.0%	60.0%
517	SAHARANPUR	5	3	2	60.0%	40.0%
518	SAMBHAL (BHIM NAGAR)	5	3	2	60.0%	40.0%
519	SANT KABIR NAGAR	5	4	1	80.0%	20.0%
520	SANT RAVIDAS NAGAR (BHADOHI)	5	5	0	100.0%	0.0%
521	SHAHJAHANPUR	5	2	3	40.0%	60.0%
522	SHAMALI (PRABUDDH NAGAR)	1	1	0	100.0%	0.0%
523	SHRAVASTI	4	2	2	50.0%	50.0%
524	SIDDHARTH NAGAR	5	2	3	40.0%	60.0%
525	SITAPUR	5	2	3	40.0%	60.0%
526	SONBHADRA	5	2	3	40.0%	60.0%
527	SULTANPUR	6	6	0	100.0%	0.0%
528	UNNAO	5	2	3	40.0%	60.0%
529	VARANASI	5	5	0	100.0%	0.0%
	<b>UTTARAKHAND</b>	<b>63</b>	<b>45</b>	<b>18</b>	<b>71.4%</b>	<b>28.6%</b>
530	ALMORA	5	3	2	60.0%	40.0%
531	BAGESHWAR	5	2	3	40.0%	60.0%
532	CHAMOLI	5	4	1	80.0%	20.0%
533	CHAMPAWAT	3	3	0	100.0%	0.0%
534	DEHRADUN	5	2	3	40.0%	60.0%
535	HARDWAR	4	4	0	100.0%	0.0%
536	NAINITAL	5	5	0	100.0%	0.0%

## FSSAI MILK PRODUCT SURVEY- 2020



S No.	State	No. of Samples	No of Samples Compliant	No of Samples Non-Compliant	Compliance%	Non-compliance%
537	PAURI GARHWAL	6	5	1	83.3%	16.7%
538	PITHORAGARH	5	2	3	40.0%	60.0%
539	RUDRAPRAYAG	5	5	0	100.0%	0.0%
540	TEHRI GARHWAL	5	2	3	40.0%	60.0%
541	UDHAM SINGH NAGAR	5	3	2	60.0%	40.0%
542	UTTARKASHI	5	5	0	100.0%	0.0%
	<b>GRAND TOTAL</b>	<b>2801</b>	<b>1668</b>	<b>1133</b>	<b>59.6%</b>	<b>40.4%</b>

## FSSAI MILK PRODUCT SURVEY- 2020



### ANNEXURE VIII: STATE-WISE COMPLIANCE LEVEL OF DIFFERENT MILK PRODUCTS

S No.	State	Milk Products														
		Chhena			Paneer			Khoa			Khoa Based Dessert			Chhena based Dessert		
		Total	Compliant	Compliant %	Total	Compliant	Compliant %	Total	Compliant	Compliant %	Total	Compliant	Compliant %	Total	Compliant	Compliant %
1	ANDAMAN AND NICOBAR ISLANDS	2	0	0.0%	1	0	0.0%	2	0	0.0%	0	0	0.0%	0	0	0.0%
2	ANDHRA PRADESH	0	0	0.0%	7	5	71.4%	7	2	28.6%	41	30	73.2%	17	13	76.5%
3	BIHAR	18	7	38.9%	36	4	11.1%	45	32	71.1%	55	43	78.2%	32	18	56.3%
4	CHANDIGARH	0	0	0.0%	1	1	100.0%	0	0	0.0%	3	1	33.3%	1	1	100.0%
5	CHHATTISGARH	4	4	100.0%	28	14	50.0%	15	6	40.0%	51	31	60.8%	33	31	93.9%
6	DADRA & NAGAR HAVELI	0	0	0.0%	1	0	0.0%	0	0	0.0%	3	2	66.7%	1	1	100.0%
7	DAMAN AND DIU	0	0	0.0%	3	0	0.0%	0	0	0.0%	6	2	33.3%	1	1	100.0%
8	GOA	0	0	0.0%	1	0	0.0%	0	0	0.0%	9	3	33.3%	0	0	0.0%
9	GUJARAT	0	0	0.0%	36	7	19.4%	13	2	15.4%	81	56	69.1%	36	21	58.3%
10	HARYANA	4	1	25.0%	21	11	52.4%	23	12	52.2%	37	24	64.9%	20	16	80.0%
11	HIMACHAL PRADESH	0	0	0.0%	8	4	50.0%	3	2	66.7%	23	22	95.7%	11	7	63.6%
12	JAMMU AND KASHMIR	0	0	0.0%	19	4	21.1%	5	3	60.0%	35	29	82.9%	14	12	85.7%
13	JHARKHAND	2	1	50.0%	21	9	42.9%	9	3	33.3%	41	19	46.3%	29	19	65.5%

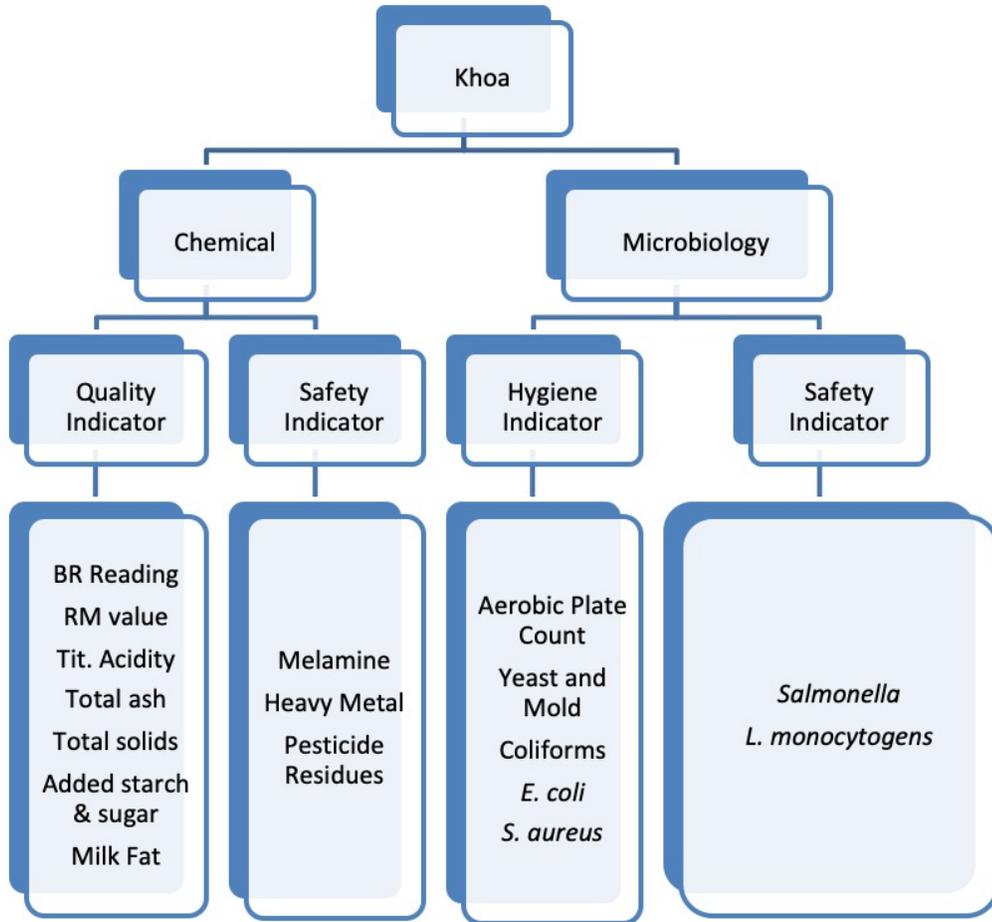


## FSSAI MILK PRODUCT SURVEY- 2020

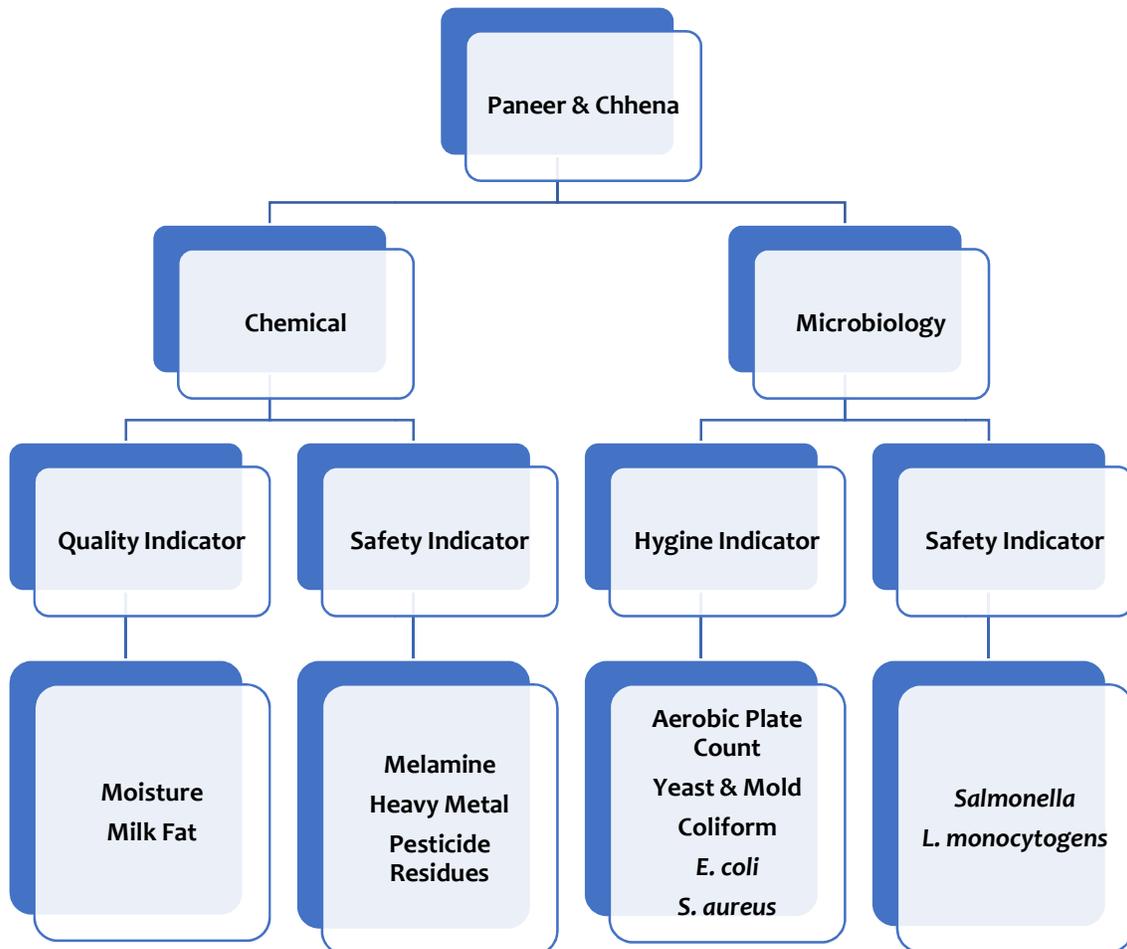
S No.	State	Milk Products														
		Chhena			Paneer			Khoa			Khoa Based Dessert			Chhena based Dessert		
		Total	Compliant	Compliant %	Total	Compliant	Compliant %	Total	Compliant	Compliant %	Total	Compliant	Compliant %	Total	Compliant	Compliant %
14	KARNATAKA	0	0	0.0%	21	2	9.5%	12	3	25.0%	96	85	88.5%	37	29	78.4%
15	KERALA	0	0	0.0%	18	2	11.1%	1	1	100.0%	42	38	90.5%	9	9	100.0%
16	MADHYA PRADESH	8	1	12.5%	44	3	6.8%	50	16	32.0%	108	58	53.7%	35	11	31.4%
17	MAHARASHTRA	1	0	0.0%	30	6	20.0%	27	9	33.3%	97	67	69.1%	40	22	55.0%
18	MANIPUR	2	1	50.0%	12	10	83.3%	1	1	100.0%	24	23	95.8%	14	14	100.0%
19	MEGHALAYA	0	0	0.0%	7	7	100.0%	2	0	0.0%	12	8	66.7%	19	16	84.2%
20	ODISHA	4	3	75.0%	24	5	20.8%	11	6	54.5%	54	29	53.7%	60	44	73.3%
21	PUNJAB	0	0	0.0%	23	2	8.7%	13	1	7.7%	48	29	60.4%	21	15	71.4%
22	RAJASTHAN	0	0	0.0%	1	0	0.0%	8	2	25.0%	10	7	70.0%	1	1	100.0%
23	SIKKIM	0	0	0.0%	4	2	50.0%	0	0	0.0%	10	7	70.0%	5	4	80.0%
24	TAMIL NADU	0	0	0.0%	35	2	5.7%	23	1	4.3%	107	100	93.5%	40	29	72.5%
25	TELANGANA	0	0	0.0%	7	0	0.0%	5	2	40.0%	137	114	83.2%	34	32	94.1%
26	UTTAR PRADESH	31	15	48.4%	88	34	38.6%	81	37	45.7%	103	71	68.9%	66	51	77.3%
27	UTTARAKHAND	0	0	0.0%	13	5	38.5%	7	2	28.6%	23	20	87.0%	20	18	90.0%
-	<b>Grand Total</b>	<b>76</b>	<b>33</b>	<b>43.4%</b>	<b>510</b>	<b>139</b>	<b>27.3%</b>	<b>363</b>	<b>143</b>	<b>39.4%</b>	<b>1256</b>	<b>918</b>	<b>73.1%</b>	<b>596</b>	<b>435</b>	<b>73.0%</b>

**FSSAI MILK PRODUCT SURVEY- 2020**

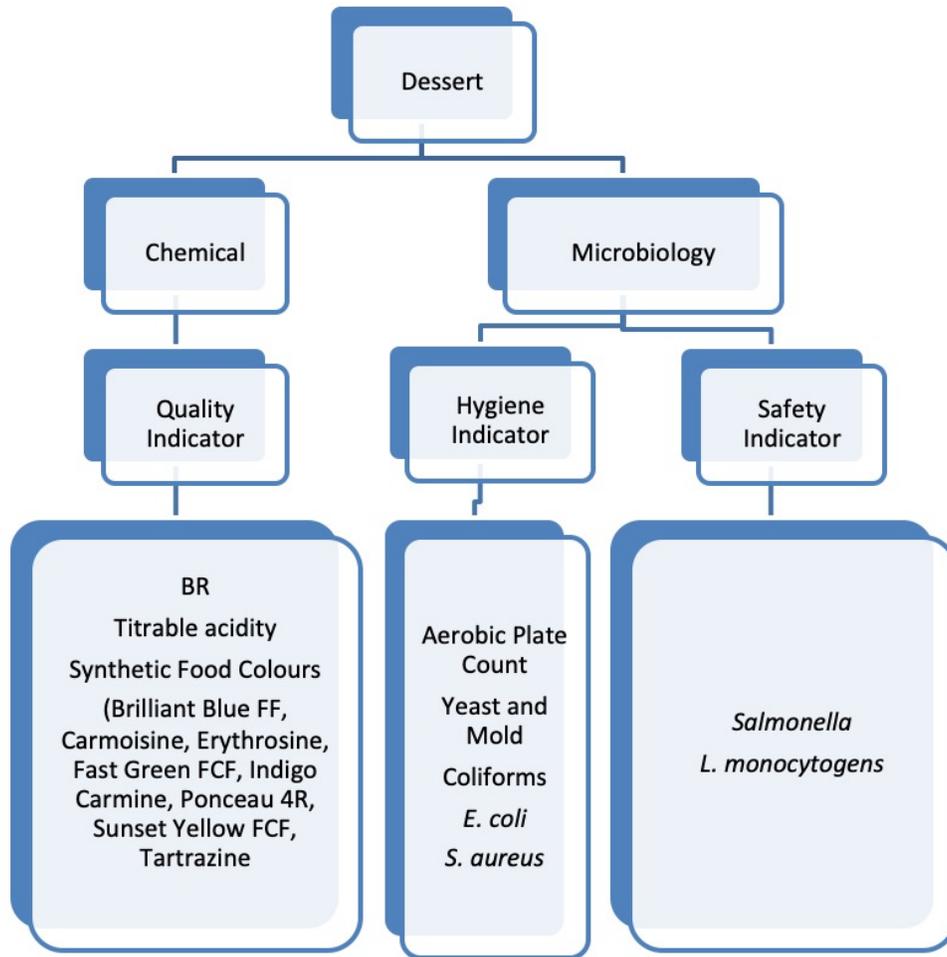
**ANNEXURE IX: CLASSIFICATION OF MICROBIOLOGICAL AND CHEMICAL TEST PARAMETERS IN HYGIENE, ADULTERATION, QUALITY AND SAFETY GROUPS OF SURVEYED MILK PRODUCTS**



**ANNEXURE IX (FIGURE 1): PARAMETER CLASSIFICATION OF KHOA**



**ANNEXURE IX (FIGURE 2): PARAMETER CLASSIFICATION OF PANEER AND CHHENA**



ANNEXURE IX (FIGURE 3): PARAMETER CLASSIFICATION OF DESSERTS

## FSSAI MILK PRODUCT SURVEY- 2020

### ANNEXURE X: CLASSIFICATION OF PRODUCT-WISE NON-COMPLIANT SAMPLES INTO TEST GROUPS

Test Group	Chhena	Khoa	Khoa Based Dessert	Paneer	Chhena based Dessert	Grand Total
<b>Chemical</b>	6	30	1	50	0	87
Quality Indicator	6	30	1	50	0	87
<b>Microbiology</b>	32	127	336	216	161	872
Hygiene Indicator	30	119	330	200	151	830
Hygiene Indicator, Safety Indicator	2	6	6	16	10	40
Safety Indicator	0	2	0	0	0	2
<b>Microbiology, Chemical</b>	5	63	1	105	0	174
Hygiene Indicator, Quality Indicator	5	61	1	102	0	169
Hygiene Indicator, Safety Indicator*, Quality Indicator	0	2	0	3	0	5
<b>Grand Total</b>	<b>43</b>	<b>220</b>	<b>338</b>	<b>371</b>	<b>161</b>	<b>1133</b>

\*Microbiological

## **FSSAI MILK PRODUCT SURVEY- 2020**

### **ANNEXURE XI: ABBREVIATIONS USED IN BELOW ANNEXURES**

Refer below abbreviation while reading the data from tables of Annexure XIV to XXV

Abbreviations: TS= Total number of samples analysed,

F= Number of samples non-compliant to meet specified criteria,

% F= Percentage of non-compliant samples from total.

\*= Grand total of all the samples taken from all the states / UTs for the specific test.

\*\*=Mean of % non-compliant samples against all the samples from all states and UTs for specific test.

## FSSAI MILK PRODUCT SURVEY- 2020



### ANNEXURE XII: *Listeria monocytogenes*: STATE/ UT-WISE TOTAL SAMPLES TESTED AND PERCENTAGE OF SAMPLE NON-COMPLIANT IN DIFFERENT PRODUCTS

<i>Listeria monocytogenes</i>																				
S No	State	Khoa			Chhena			Paneer			Chhena based desserts			Khoa based desserts			Total samples Non-Compliant (%)			
		TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	
1	BIHAR	45	2	4.4%	18	1	5.6%	36	9	25.0%	32	3	9.4%	55	2	3.6%	186	17	9.1%	
2	HARYANA	23	1	4.3%	4	0	0.0%	21	1	4.8%	20	0	0.0%	37	0	0.0%	105	2	1.9%	
3	HIMACHAL PRADESH	3	0	0.0%	0	0	0.0%	8	0	0.0%	11	1	9.1%	23	0	0.0%	45	1	2.2%	
4	JAMMU AND KASHMIR	5	0	0.0%	0	0	0.0%	19	0	0.0%	14	1	7.1%	35	0	0.0%	73	1	1.4%	
5	MANIPUR	1	0	0.0%	2	0	0.0%	12	1	8.3%	14	0	0.0%	24	1	4.2%	53	2	3.8%	
6	MEGHALAYA	2	0	0.0%	0	0	0.0%	7	0	0.0%	19	1	5.3%	12	0	0.0%	40	1	2.5%	
7	PUNJAB	13	1	7.7%	0	0	0.0%	23	0	0.0%	21	0	0.0%	48	0	0.0%	105	1	1.0%	
8	RAJASTHAN	8	2	25.0%	0	0	0.0%	1	0	0.0%	1	0	0.0%	10	0	0.0%	20	2	10.0%	
9	SIKKIM	0	0	0.0%	0	0	0.0%	4	0	0.0%	5	1	20.0%	10	2	20.0%	19	3	15.8%	
10	UTTAR PRADESH	81	4	4.9%	31	0	0.0%	88	0	0.0%	66	0	0.0%	103	0	0.0%	369	4	1.1%	
-	<b>G. Total/ Mean of % failed (from all states &amp; UT)</b>	<b>363</b>	<b>10</b>	<b>2.8%</b>	<b>76</b>	<b>1</b>	<b>1.3%</b>	<b>510</b>	<b>11</b>	<b>2.2%</b>	<b>596</b>	<b>7</b>	<b>1.2%</b>	<b>1256</b>	<b>5</b>	<b>0.4%</b>	<b>2801</b>	<b>34</b>	<b>1.2%</b>	

**FSSAI MILK PRODUCT SURVEY- 2020**



**ANNEXURE XIII: Salmonella spp.: STATE/ UT-WISE TOTAL SAMPLES TESTED AND PERCENTAGE OF SAMPLE NON-COMPLIANT IN DIFFERENT PRODUCTS**

<b>Salmonella spp.</b>																			
<b>S No</b>	<b>State</b>	<b>Khoa</b>			<b>Chhena</b>			<b>Paneer</b>			<b>Chhena based desserts</b>			<b>Khoa based desserts</b>			<b>Total samples Non-Compliant (%)</b>		
		<b>TS</b>	<b>F</b>	<b>% F</b>	<b>TS</b>	<b>F</b>	<b>% F</b>	<b>TS</b>	<b>F</b>	<b>% F</b>	<b>TS</b>	<b>F</b>	<b>% F</b>	<b>TS</b>	<b>F</b>	<b>% F</b>	<b>TS</b>	<b>F</b>	<b>% F</b>
1	BIHAR	45	0	0.0%	18	0	0.0%	36	5	13.9%	32	2	6.3%	55	0	0.0%	186	7	3.8%
2	CHHATTISGARH	15	0	0.0%	4	0	0.0%	28	1	3.6%	33	0	0.0%	51	0	0.0%	131	1	0.8%
3	ODISHA	11	0	0.0%	4	0	0.0%	24	0	0.0%	60	2	3.3%	54	0	0.0%	153	2	1.3%
4	PUNJAB	13	0	0.0%	0	0	0.0%	23	1	4.3%	21	0	0.0%	48	1	2.1%	105	2	1.9%
5	TAMIL NADU	23	0	0.0%	0	0	0.0%	35	1	2.9%	40	0	0.0%	107	0	0.0%	205	1	0.5%
6	UTTAR PRADESH	81	0	0.0%	31	1	3.2%	88	1	1.1%	66	0	0.0%	103	0	0.0%	369	2	0.5%
-	<b>G. Total/ Mean of % failed (from all states &amp; UT)</b>	<b>363</b>	<b>0</b>	<b>0.0%</b>	<b>76</b>	<b>1</b>	<b>1.3%</b>	<b>510</b>	<b>9</b>	<b>1.8%</b>	<b>596</b>	<b>4</b>	<b>0.7%</b>	<b>1256</b>	<b>1</b>	<b>0.1%</b>	<b>2801</b>	<b>15</b>	<b>0.5%</b>

**FSSAI MILK PRODUCT SURVEY- 2020**



**ANNEXURE XIV: E. coli: STATE/ UT-WISE TOTAL SAMPLES TESTED AND PERCENTAGE OF SAMPLE NON-COMPLIANT IN DIFFERENT PRODUCTS**

<i>E. coli</i>																			
S No	State	Khoa			Chhena			Paneer			Chhena based desserts			Khoa based desserts			Total samples Non-Compliant (%)		
		TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F
1	ANDHRA PRADESH	7	0	0.0%	0	0	0.0%	7	0	0.0%	17	1	5.9%	41	2	4.9%	72	3	4.2%
2	BIHAR	45	2	4.4%	18	7	38.9%	36	26	72.2%	32	10	31.3%	55	4	7.3%	186	49	26.3%
3	CHHATTISGARH	15	0	0.0%	4	0	0.0%	28	3	10.7%	33	1	3.0%	51	0	0.0%	131	4	3.1%
4	GUJARAT	13	0	0.0%	0	0	0.0%	36	1	2.8%	36	0	0.0%	81	0	0.0%	166	1	0.6%
5	KARNATAKA	12	0	0.0%	0	0	0.0%	21	5	23.8%	37	1	2.7%	96	0	0.0%	166	6	3.6%
6	KERALA	1	0	0.0%	0	0	0.0%	18	1	5.6%	9	0	0.0%	42	0	0.0%	70	1	1.4%
7	MADHYA PRADESH	50	1	2.0%	8	0	0.0%	44	1	2.3%	35	1	2.9%	108	0	0.0%	245	3	1.2%
8	MAHARASHTRA	27	1	3.7%	1	0	0.0%	30	2	6.7%	40	0	0.0%	97	0	0.0%	195	3	1.5%
9	ODISHA	11	0	0.0%	4	0	0.0%	24	0	0.0%	60	1	1.7%	54	0	0.0%	153	1	0.7%
10	TAMIL NADU	23	1	4.3%	0	0	0.0%	35	6	17.1%	40	0	0.0%	107	0	0.0%	205	7	3.4%
-	<b>G. Total / Mean of % failed (from all states &amp; UT)</b>	<b>363</b>	<b>5</b>	<b>1.4%</b>	<b>76</b>	<b>7</b>	<b>9.2%</b>	<b>510</b>	<b>45</b>	<b>8.8%</b>	<b>596</b>	<b>15</b>	<b>2.5%</b>	<b>1256</b>	<b>6</b>	<b>0.5%</b>	<b>2801</b>	<b>78</b>	<b>2.8%</b>

## FSSAI MILK PRODUCT SURVEY- 2020



### ANNEXURE XV: *S. aureus*: STATE/ UT-WISE TOTAL SAMPLES TESTED AND PERCENTAGE OF SAMPLE NON-COMPLIANT IN DIFFERENT PRODUCTS

<i>S. aureus</i>																			
S No	State	Khoa			Chhena			Paneer			Chhena based desserts			Khoa based desserts			Total samples Non-Compliant (%)		
		TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F
1	BIHAR	45	4	8.9%	18	6	33.3%	36	22	61.1%	32	10	31.3%	55	4	7.3%	186	46	24.7%
2	CHHATTISGARH	15	1	6.7%	4	0	0.0%	28	2	7.1%	33	1	3.0%	51	1	2.0%	131	5	3.8%
3	JHARKHAND	9	0	0.0%	2	0	0.0%	21	0	0.0%	29	1	3.4%	41	0	0.0%	102	1	1.0%
4	KARNATAKA	12	2	16.7%	0	0	0.0%	21	2	9.5%	37	0	0.0%	96	1	1.0%	166	5	3.0%
5	MAHARASHTRA	27	2	7.4%	1	0	0.0%	30	0	0.0%	40	1	2.5%	97	0	0.0%	195	3	1.5%
6	TAMIL NADU	23	3	13.0%	0	0	0.0%	35	0	0.0%	40	0	0.0%	107	0	0.0%	205	3	1.5%
7	TELANGANA	5	0	0.0%	0	0	0.0%	7	0	0.0%	34	2	5.9%	137	1	0.7%	183	3	1.6%
-	<b>G. Total / Mean of % failed (from all states &amp; UT)</b>	<b>363</b>	<b>12</b>	<b>3.3%</b>	<b>76</b>	<b>6</b>	<b>7.9%</b>	<b>510</b>	<b>26</b>	<b>5.1%</b>	<b>596</b>	<b>15</b>	<b>2.5%</b>	<b>1256</b>	<b>7</b>	<b>0.6%</b>	<b>2801</b>	<b>66</b>	<b>2.4%</b>

**FSSAI MILK PRODUCT SURVEY- 2020**



**ANNEXURE XVI: COLIFORM: STATE/ UT-WISE TOTAL SAMPLES TESTED AND PERCENTAGE OF SAMPLE NON-COMPLIANT IN DIFFERENT PRODUCTS**

Coliform																			
S No	State	Khoa			Chhena			Paneer			Chhena based desserts			Khoa based desserts			Total samples Non-Compliant (%)		
		TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F
1	ANDAMAN AND NICOBAR ISLANDS	2	2	100.0%	2	2	100.0%	1	1	100.0%	0	0	0.0%	0	0	0.0%	5	5	100.0%
2	ANDHRA PRADESH	7	1	14.3%	0	0	0.0%	7	2	28.6%	17	4	23.5%	41	6	14.6%	72	13	18.1%
3	BIHAR	45	6	13.3%	18	11	61.1%	36	32	88.9%	32	13	40.6%	55	8	14.5%	186	70	37.6%
4	CHHATTISGARH	15	4	26.7%	4	0	0.0%	28	7	25.0%	33	1	3.0%	51	3	5.9%	131	15	11.5%
5	DADRA & NAGAR HAVELI	0	0	0.0%	0	0	0.0%	1	1	100.0%	1	0	0.0%	3	1	33.3%	5	2	40.0%
6	DAMAN AND DIU	0	0	0.0%	0	0	0.0%	3	2	66.7%	1	0	0.0%	6	3	50.0%	10	5	50.0%
7	GUJARAT	13	7	53.8%	0	0	0.0%	36	17	47.2%	36	6	16.7%	81	16	19.8%	166	46	27.7%
8	HARYANA	23	1	4.3%	4	0	0.0%	21	1	4.8%	20	0	0.0%	37	2	5.4%	105	4	3.8%
9	HIMACHAL PRADESH	3	0	0.0%	0	0	0.0%	8	1	12.5%	11	0	0.0%	23	0	0.0%	45	1	2.2%
10	JAMMU AND KASHMIR	5	0	0.0%	0	0	0.0%	19	5	26.3%	14	1	7.1%	35	1	2.9%	73	7	9.6%
11	JHARKHAND	9	2	22.2%	2	1	50.0%	21	5	23.8%	29	4	13.8%	41	7	17.1%	102	19	18.6%
12	KARNATAKA	12	4	33.3%	0	0	0.0%	21	18	85.7%	37	6	16.2%	96	4	4.2%	166	32	19.3%
13	KERALA	1	0	0.0%	0	0	0.0%	18	12	66.7%	9	0	0.0%	42	0	0.0%	70	12	17.1%
14	MADHYA	50	24	48.0%	8	1	12.5%	44	15	34.1%	35	15	42.9%	108	32	29.6%	245	87	35.5%

## FSSAI MILK PRODUCT SURVEY- 2020

Coliform																			
S No	State	Khoa			Chhena			Paneer			Chhena based desserts			Khoa based desserts			Total samples Non-Compliant (%)		
		TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F
	PRADESH																		
15	MAHARASHTRA	27	18	66.7%	1	0	0.0%	30	14	46.7%	40	12	30.0%	97	17	17.5%	195	61	31.3%
16	MANIPUR	1	0	0.0%	2	1	50.0%	12	1	8.3%	14	0	0.0%	24	0	0.0%	53	2	3.8%
17	MEGHALAYA	2	0	0.0%	0	0	0.0%	7	0	0.0%	19	1	5.3%	12	0	0.0%	40	1	2.5%
18	ODISHA	11	2	18.2%	4	1	25.0%	24	7	29.2%	60	12	20.0%	54	9	16.7%	153	31	20.3%
19	PUNJAB	13	0	0.0%	0	0	0.0%	23	2	8.7%	21	0	0.0%	48	2	4.2%	105	4	3.8%
20	RAJASTHAN	8	0	0.0%	0	0	0.0%	1	0	0.0%	1	0	0.0%	10	2	20.0%	20	2	10.0%
21	TAMIL NADU	23	11	47.8%	0	0	0.0%	35	31	88.6%	40	7	17.5%	107	4	3.7%	205	53	25.9%
22	TELANGANA	5	2	40.0%	0	0	0.0%	7	4	57.1%	34	1	2.9%	137	4	2.9%	183	11	6.0%
23	UTTAR PRADESH	81	0	0.0%	31	4	12.9%	88	9	10.2%	66	2	3.0%	103	4	3.9%	369	19	5.1%
24	UTTARAKHAND	7	1	14.3%	0	0	0.0%	13	5	38.5%	20	1	5.0%	23	0	0.0%	63	7	11.1%
-	<b>G. Total / Mean of % failed (from all states &amp; UT)</b>	<b>363</b>	<b>85</b>	<b>23.4%</b>	<b>76</b>	<b>21</b>	<b>27.6%</b>	<b>510</b>	<b>192</b>	<b>37.6%</b>	<b>596</b>	<b>86</b>	<b>14.4%</b>	<b>1256</b>	<b>125</b>	<b>10.0%</b>	<b>2801</b>	<b>509</b>	<b>18.2%</b>

**FSSAI MILK PRODUCT SURVEY- 2020**



**ANNEXURE XVII: YEAST & MOLD COUNT: STATE/ UT-WISE TOTAL SAMPLES TESTED AND PERCENTAGE OF SAMPLE NON-COMPLIANT IN DIFFERENT PRODUCTS**

Yeast & Mold Count																			
S No	State	Khoa			Chhena			Paneer			Chhena based desserts			Khoa based desserts			Total samples Non-Compliant (%)		
		TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F
1	ANDAMAN AND NICOBAR ISLANDS	2	2	100.0 %	2	2	100.0 %	1	1	100.0 %	0	0	0.0%	0	0	0.0%	5	5	100.0 %
2	ANDHRA PRADESH	7	2	28.6%	0	0	0.0%	7	1	14.3%	17	0	0.0%	41	3	7.3%	72	6	8.3%
3	BIHAR	45	7	15.6%	18	10	55.6%	36	31	86.1%	32	14	43.8%	55	7	12.7%	186	69	37.1%
4	CHANDIGARH	0	0	0.0%	0	0	0.0%	1	0	0.0%	1	0	0.0%	3	2	66.7%	5	2	40.0%
5	CHHATTISGARH	15	2	13.3%	4	0	0.0%	28	4	14.3%	33	1	3.0%	51	5	9.8%	131	12	9.2%
6	DADRA & NAGAR HAVELI	0	0	0.0%	0	0	0.0%	1	1	100.0 %	1	0	0.0%	3	1	33.3%	5	2	40.0%
7	DAMAN AND DIU	0	0	0.0%	0	0	0.0%	3	2	66.7%	1	0	0.0%	6	4	66.7%	10	6	60.0%
8	GOA	0	0	0.0%	0	0	0.0%	1	0	0.0%	0	0	0.0%	9	6	66.7%	10	6	60.0%
9	GUJARAT	13	7	53.8%	0	0	0.0%	36	17	47.2%	36	11	30.6%	81	20	24.7%	166	55	33.1%
10	HARYANA	23	9	39.1%	4	3	75.0%	21	7	33.3%	20	4	20.0%	37	12	32.4%	105	35	33.3%
11	HIMACHAL	3	0	0.0%	0	0	0.0%	8	4	50.0%	11	4	36.4%	23	1	4.3%	45	9	20.0%

## FSSAI MILK PRODUCT SURVEY- 2020

Yeast & Mold Count																				
S No	State	Khoa			Chhena			Paneer			Chhena based desserts			Khoa based desserts			Total samples Non-Compliant (%)			
		TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	
	PRADESH																			
12	JAMMU AND KASHMIR	5	0	0.0%	0	0	0.0%	19	15	78.9%	14	2	14.3%	35	6	17.1%	73	23	31.5%	
13	JHARKHAND	9	1	11.1%	2	0	0.0%	21	7	33.3%	29	5	17.2%	41	6	14.6%	102	19	18.6%	
14	KARNATAKA	12	8	66.7%	0	0	0.0%	21	19	90.5%	37	8	21.6%	96	10	10.4%	166	45	27.1%	
15	KERALA	1	0	0.0%	0	0	0.0%	18	16	88.9%	9	0	0.0%	42	4	9.5%	70	20	28.6%	
16	MADHYA PRADESH	50	25	50.0%	8	3	37.5%	44	19	43.2%	35	23	65.7%	108	48	44.4%	245	118	48.2%	
17	MAHARASHTRA	27	18	66.7%	1	0	0.0%	30	14	46.7%	40	11	27.5%	97	22	22.7%	195	65	33.3%	
18	MANIPUR	1	0	0.0%	2	1	50.0%	12	2	16.7%	14	0	0.0%	24	1	4.2%	53	4	7.5%	
19	MEGHALAYA	2	2	100.0%	0	0	0.0%	7	0	0.0%	19	3	15.8%	12	2	16.7%	40	7	17.5%	
20	ODISHA	11	1	9.1%	4	1	25.0%	24	5	20.8%	60	7	11.7%	54	5	9.3%	153	19	12.4%	
21	PUNJAB	13	9	69.2%	0	0	0.0%	23	19	82.6%	21	5	23.8%	48	19	39.6%	105	52	49.5%	
22	RAJASTHAN	8	4	50.0%	0	0	0.0%	1	1	100.0%	1	0	0.0%	10	3	30.0%	20	8	40.0%	
23	SIKKIM	0	0	0.0%	0	0	0.0%	4	2	50.0%	5	1	20.0%	10	2	20.0%	19	5	26.3%	

## FSSAI MILK PRODUCT SURVEY- 2020

Yeast & Mold Count																			
S No	State	Khoa			Chhena			Paneer			Chhena based desserts			Khoa based desserts			Total samples Non-Compliant (%)		
		TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F
24	TAMIL NADU	23	17	73.9%	0	0	0.0%	35	33	94.3%	40	11	27.5%	107	5	4.7%	205	66	32.2%
25	TELANGANA	5	3	60.0%	0	0	0.0%	7	6	85.7%	34	1	2.9%	137	21	15.3%	183	31	16.9%
26	UTTAR PRADESH	81	31	38.3%	31	14	45.2%	88	49	55.7%	66	13	19.7%	103	29	28.2%	369	136	36.9%
27	UTTARAKHAND	7	3	42.9%	0	0	0.0%	13	7	53.8%	20	2	10.0%	23	2	8.7%	63	14	22.2%
-	<b>G. Total/ Mean of % failed (from all states &amp; UT)</b>	<b>363</b>	<b>151</b>	<b>41.6%</b>	<b>76</b>	<b>34</b>	<b>44.7%</b>	<b>510</b>	<b>282</b>	<b>55.3%</b>	<b>596</b>	<b>126</b>	<b>21.1%</b>	<b>1256</b>	<b>246</b>	<b>19.6%</b>	<b>2801</b>	<b>839</b>	<b>30.0%</b>

## FSSAI MILK PRODUCT SURVEY- 2020



### ANNEXURE XVIII: AEROBIC PLATE COUNT: STATE/ UT-WISE TOTAL SAMPLES TESTED AND PERCENTAGE OF SAMPLE NON-COMPLIANT IN DIFFERENT PRODUCTS

AEROBIC PLATE COUNT																			
S N o	State	Khoa			Chhena			Paneer			Chhena based desserts			Khoa based desserts			Total samples Non-Compliant (%)		
		TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F
1	ANDAMAN AND NICOBAR ISLANDS	2	2	100.0%	2	2	100.0%	1	1	100.0%	0	0	0.0%	0	0	0.0%	5	5	100.0%
2	ANDHRA PRADESH	7	4	57.1%	0	0	0.0%	7	2	28.6%	17	3	17.6%	41	11	26.8%	72	20	27.8%
3	BIHAR	45	10	22.2%	18	3	16.7%	36	22	61.1%	32	3	9.4%	55	10	18.2%	186	48	25.8%
4	CHHATTISGARH	15	9	60.0%	4	0	0.0%	28	10	35.7%	33	1	3.0%	51	20	39.2%	131	40	30.5%
5	DADRA & NAGAR HAVELI	0	0	0.0%	0	0	0.0%	1	1	100.0%	1	0	0.0%	3	1	33.3%	5	2	40.0%
6	DAMAN AND DIU	0	0	0.0%	0	0	0.0%	3	2	66.7%	1	0	0.0%	6	3	50.0%	10	5	50.0%
7	GOA	0	0	0.0%	0	0	0.0%	1	0	0.0%	0	0	0.0%	9	5	55.6%	10	5	50.0%
8	GUJARAT	13	9	69.2%	0	0	0.0%	36	17	47.2%	36	12	33.3%	81	21	25.9%	166	59	35.5%
9	HARYANA	23	9	39.1%	4	2	50.0%	21	4	19.0%	20	1	5.0%	37	6	16.2%	105	22	21.0%
10	JAMMU AND KASHMIR	5	0	0.0%	0	0	0.0%	19	1	5.3%	14	0	0.0%	35	1	2.9%	73	2	2.7%
11	JHARKHAND	9	6	66.7%	2	1	50.0%	21	10	47.6%	29	8	27.6%	41	22	53.7%	102	47	46.1%

## FSSAI MILK PRODUCT SURVEY- 2020

AEROBIC PLATE COUNT																			
S N o	State	Khoa			Chhena			Paneer			Chhena based desserts			Khoa based desserts			Total samples Non-Compliant (%)		
		TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F
12	KARNATAKA	12	8	66.7%	0	0	0.0%	21	19	90.5%	37	2	5.4%	96	7	7.3%	166	36	21.7%
13	KERALA	1	0	0.0%	0	0	0.0%	18	15	83.3%	9	0	0.0%	42	0	0.0%	70	15	21.4%
14	MADHYA PRADESH	50	30	60.0%	8	3	37.5%	44	17	38.6%	35	21	60.0%	108	48	44.4%	245	119	48.6%
15	MAHARASHTRA	27	18	66.7%	1	0	0.0%	30	13	43.3%	40	17	42.5%	97	30	30.9%	195	78	40.0%
16	MANIPUR	1	0	0.0%	2	0	0.0%	12	2	16.7%	14	0	0.0%	24	0	0.0%	53	2	3.8%
17	MEGHALAYA	2	0	0.0%	0	0	0.0%	7	0	0.0%	19	0	0.0%	12	2	16.7%	40	2	5.0%
18	ODISHA	11	5	45.5%	4	1	25.0%	24	17	70.8%	60	15	25.0%	54	25	46.3%	153	63	41.2%
19	PUNJAB	13	4	30.8%	0	0	0.0%	23	14	60.9%	21	2	9.5%	48	5	10.4%	105	25	23.8%
20	RAJASTHAN	8	4	50.0%	0	0	0.0%	1	0	0.0%	1	0	0.0%	10	2	20.0%	20	6	30.0%
21	SIKKIM	0	0	0.0%	0	0	0.0%	4	0	0.0%	5	1	20.0%	10	3	30.0%	19	4	21.1%
22	TAMIL NADU	23	16	69.6%	0	0	0.0%	35	33	94.3%	40	8	20.0%	107	6	5.6%	205	63	30.7%
23	TELANGANA	5	2	40.0%	0	0	0.0%	7	5	71.4%	34	2	5.9%	137	14	10.2%	183	23	12.6%
24	UTTAR PRADESH	81	18	22.2%	31	7	22.6%	88	25	28.4%	66	4	6.1%	103	17	16.5%	369	71	19.2%
25	UTTARAKHAND	7	0	0.0%	0	0	0.0%	13	2	15.4%	20	0	0.0%	23	2	8.7%	63	4	6.3%
-	<b>G. Total/ Mean of % failed (from all states &amp; UT)</b>	<b>363</b>	<b>154</b>	<b>42.4%</b>	<b>76</b>	<b>19</b>	<b>25.0%</b>	<b>510</b>	<b>232</b>	<b>45.5%</b>	<b>596</b>	<b>100</b>	<b>16.8%</b>	<b>1256</b>	<b>261</b>	<b>20.8%</b>	<b>2801</b>	<b>766</b>	<b>27.3%</b>

## FSSAI MILK PRODUCT SURVEY- 2020



### ANNEXURE XIX: BR READING: STATE/ UT-WISE TOTAL SAMPLES TESTED AND PERCENTAGE OF SAMPLE NON-COMPLIANT IN KHOA

BR READING				
S No	State	Khoa		
		TS	F	% F
1	ANDAMAN AND NICOBAR ISLANDS	2	1	50.0%
2	BIHAR	45	1	2.2%
3	HIMACHAL PRADESH	3	1	33.3%
4	JHARKHAND	9	1	11.1%
5	MAHARASHTRA	27	1	3.7%
6	PUNJAB	13	1	7.7%
7	TAMIL NADU	23	13	56.5%
8	TELANGANA	5	2	40.0%
9	UTTAR PRADESH	81	4	4.9%
--	<b>G. Total (All States and UT)</b>	<b>363</b>	<b>25</b>	<b>6.9%</b>

Specification for BR reading is available only for Khoa under FSSR. Details of the BR reading results in milk-based desserts is available at Annexure XXV



## FSSAI MILK PRODUCT SURVEY- 2020

### ANNEXURE XX: MILK FAT: STATE/ UT-WISE TOTAL SAMPLES TESTED AND PERCENTAGE OF SAMPLE NON-COMPLIANT IN DIFFERENT PRODUCTS

MILK FAT													
S No	State	Khoa			Chhena			Paneer			Total samples non-compliant (%)		
		TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F
1	ANDAMAN AND NICOBAR ISLANDS	2	2	100.0%	2	2	100.0%	1	1	100.0%	5	5	100.0%
2	ANDHRA PRADESH	7	1	14.3%	0	0	0.0%	7	0	0.0%	14	1	7.1%
3	BIHAR	45	6	13.3%	18	1	5.6%	36	7	19.4%	99	14	14.1%
4	CHHATTISGARH	15	2	13.3%	4	0	0.0%	28	1	3.6%	47	3	6.4%
5	DAMAN AND DIU	0	0	0.0%	0	0	0.0%	3	3	100.0%	3	3	100.0%
6	GOA	0	0	0.0%	0	0	0.0%	1	1	100.0%	1	1	100.0%
7	GUJARAT	13	3	23.1%	0	0	0.0%	36	27	75.0%	49	30	61.2%
8	HARYANA	23	3	13.0%	4	0	0.0%	21	3	14.3%	48	6	12.5%
9	HIMACHAL PRADESH	3	1	33.3%	0	0	0.0%	8	0	0.0%	11	1	9.1%
10	JAMMU AND KASHMIR	5	2	40.0%	0	0	0.0%	19	2	10.5%	24	4	16.7%
11	JHARKHAND	9	2	22.2%	2	1	50.0%	21	3	14.3%	32	6	18.8%
12	KARNATAKA	12	2	16.7%	0	0	0.0%	21	6	28.6%	33	8	24.2%
13	KERALA	1	0	0.0%	0	0	0.0%	18	4	22.2%	19	4	21.1%
14	MADHYA PRADESH	50	5	10.0%	8	4	50.0%	44	37	84.1%	102	46	45.1%
15	MAHARASHTRA	27	2	7.4%	1	1	100.0%	30	20	66.7%	58	23	39.7%
16	MEGHALAYA	2	1	50.0%	0	0	0.0%	7	0	0.0%	9	1	11.1%
17	ODISHA	11	1	9.1%	4	0	0.0%	24	6	25.0%	39	7	17.9%
18	PUNJAB	13	2	15.4%	0	0	0.0%	23	1	4.3%	36	3	8.3%
19	RAJASTHAN	8	1	12.5%	0	0	0.0%	1	0	0.0%	9	1	11.1%

## FSSAI MILK PRODUCT SURVEY- 2020



MILK FAT													
S No	State	Khoa			Chhena			Paneer			Total samples non-compliant (%)		
		TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F
20	TAMIL NADU	23	14	60.9%	0	0	0.0%	35	13	37.1%	58	27	46.6%
21	TELANGANA	5	1	20.0%	0	0	0.0%	7	5	71.4%	12	6	50.0%
22	UTTAR PRADESH	81	13	16.0%	31	1	3.2%	88	5	5.7%	200	19	9.5%
23	UTTARAKHAND	7	2	28.6%	0	0	0.0%	13	0	0.0%	20	2	10.0%
-	<b>G. Total*/ Mean of % failed** (from all states &amp; UT)</b>	<b>363</b>	<b>66</b>	<b>18.2%</b>	<b>76</b>	<b>10</b>	<b>13.2%</b>	<b>510</b>	<b>145</b>	<b>28.4%</b>	<b>949</b>	<b>221</b>	<b>23.3%</b>

## FSSAI MILK PRODUCT SURVEY- 2020

### ANNEXURE XXI: MOISTURE: STATE/ UT-WISE TOTAL SAMPLES TESTED AND PERCENTAGE OF SAMPLE NON-COMPLIANT IN DIFFERENT PRODUCTS

MOISTURE													
S. No.	State	Khoa			Chhena			Paneer			Total samples non-compliant (%)		
		TS	F	% F	TS	F	% F	TS	F	% F	TS	F	% F
1	BIHAR	0	0	0.0%	18	1	5.6%	36	2	5.6%	54	3	5.6%
2	HARYANA	0	0	0.0%	4	0	0.0%	21	2	9.5%	25	2	8.0%
3	JAMMU AND KASHMIR	0	0	0.0%	0	0	0.0%	19	2	10.5%	19	2	10.5%
4	JHARKHAND	0	0	0.0%	2	0	0.0%	21	2	9.5%	23	2	8.7%
5	KARNATAKA	0	0	0.0%	0	0	0.0%	21	1	4.8%	21	1	4.8%
6	ODISHA	0	0	0.0%	4	0	0.0%	24	6	25.0%	28	6	21.4%
7	PUNJAB	0	0	0.0%	0	0	0.0%	23	1	4.3%	23	1	4.3%
8	TAMIL NADU	0	0	0.0%	0	0	0.0%	35	1	2.9%	35	1	2.9%
9	TELANGANA	0	0	0.0%	0	0	0.0%	7	1	14.3%	7	1	14.3%
10	UTTAR PRADESH	0	0	0.0%	31	0	0.0%	88	3	3.4%	119	3	2.5%
-	<b>G. Total*/ Mean of % failed** (from all States &amp; UT)</b>	<b>0</b>	<b>0</b>	<b>0.0%</b>	<b>76</b>	<b>1</b>	<b>1.3%</b>	<b>510</b>	<b>21</b>	<b>4.1%</b>	<b>586</b>	<b>22</b>	<b>3.8%</b>

## FSSAI MILK PRODUCT SURVEY- 2020



### ANNEXURE XXII: TOTAL ASH, TOTAL SOLIDS, ADDED STARCH AND SUGAR, TITRATABLE ACIDITY, SYNTHETIC FOOD COLOURS: STATE/UT-WISE TOTAL SAMPLES TESTED AND PERCENTAGE OF SAMPLE NON-COMPLIANT IN DIFFERENT PRODUCTS

<b>Total Ash:</b> Two samples out of 363 (0.6%) of Khoa samples were non-compliant for Ash. This is one sample from each state of Bihar and Chhattisgarh.
<b>Total Solid:</b> Overall, 8 samples in 363 (2.2%) Khoa samples analyzed were non-compliant for total solids. Non-compliance is reported for samples from Rajasthan (3), Uttar Pradesh (2), Uttarakhand (1), Gujarat (1) and Punjab (1).
<b>Test for added starch and Sugar:</b> Overall, 8 samples in 363 (2.2%) Khoa samples analyzed were non-compliant for added starch and sugar. These include four samples from Bihar, three samples from Chhattisgarh and one from Jharkhand.
<b>Titrateable Acidity:</b> One Sample of Khoa out 363 (0.3%) was non-compliant for Titrateable Acidity. This sample is from Karnataka.
<b>Synthetic Food Colour:</b> Two samples (of Khoa based desserts) out of total 1852 of desserts were non-compliant for synthetic food colour (higher than the prescribed limit). One sample for Tartrazine (Milk Burfi from Tamil Nadu) and another for Sunset Yellow (Kala jamun from Telangana).



**FSSAI MILK PRODUCT SURVEY- 2020**

**ANNEXURE XXIII: STATE/ UT-WISE OBSERVATION OF DESSERT SAMPLES WITH >0.9 TITRATABLE ACIDITY**

S. No.	State	Chhena based desserts			Khoa based desserts			Total		
		TS	F	%F	TS	F	%F	TS	F	%F
1	ANDHRA PRADESH	17	0	0.0%	41	0	0.0%	58	0	0.0%
2	BIHAR	32	0	0.0%	55	0	0.0%	87	0	0.0%
3	CHANDIGARH	1	0	0.0%	3	0	0.0%	4	0	0.0%
4	CHHATTISGARH	33	0	0.0%	51	0	0.0%	84	0	0.0%
5	DADRA & NAGAR HAVELI	1	0	0.0%	3	0	0.0%	4	0	0.0%
6	DAMAN AND DIU	1	0	0.0%	6	0	0.0%	7	0	0.0%
7	GOA	0	0	0.0%	9	0	0.0%	9	0	0.0%
8	GUJARAT	36	0	0.0%	81	0	0.0%	117	0	0.0%
9	HARYANA	20	0	0.0%	37	1	2.7%	57	1	1.8%
10	HIMACHAL PRADESH	11	0	0.0%	23	0	0.0%	34	0	0.0%
11	JAMMU AND KASHMIR	14	0	0.0%	35	0	0.0%	49	0	0.0%
12	JHARKHAND	29	0	0.0%	41	0	0.0%	70	0	0.0%
13	KARNATAKA	37	0	0.0%	96	0	0.0%	133	0	0.0%
14	KERALA	9	0	0.0%	42	0	0.0%	51	0	0.0%
15	MADHYA PRADESH	35	0	0.0%	108	0	0.0%	143	0	0.0%
16	MAHARASHTRA	40	1	2.5%	97	0	0.0%	137	1	0.7%
17	MANIPUR	14	0	0.0%	24	1	4.2%	38	1	2.6%
18	MEGHALAYA	19	0	0.0%	12	0	0.0%	31	0	0.0%
19	ODISHA	60	0	0.0%	54	0	0.0%	114	0	0.0%
20	PUNJAB	21	0	0.0%	48	0	0.0%	69	0	0.0%
21	RAJASTHAN	1	0	0.0%	10	0	0.0%	11	0	0.0%
22	SIKKIM	5	0	0.0%	10	0	0.0%	15	0	0.0%
23	TAMIL NADU	40	0	0.0%	107	0	0.0%	147	0	0.0%
24	TELANGANA	34	1	2.9%	137	1	0.7%	171	2	1.2%
25	UTTAR PRADESH	66	0	0.0%	103	1	1.0%	169	1	0.6%

**FSSAI MILK PRODUCT SURVEY- 2020**



26	UTTARAKHAND	20	0	0.0%	23	0	0.0%	43	0	0.0%
<b>Grand Total</b>		<b>596</b>	<b>2</b>	<b>0.3%</b>	<b>1256</b>	<b>4</b>	<b>0.3%</b>	<b>1852</b>	<b>6</b>	<b>0.3%</b>



## FSSAI MILK PRODUCT SURVEY- 2020

### ANNEXURE XXIV: STATE/ UT-WISE OBSERVATION OF DESSERT SAMPLES WITH SAMPLES DEVIATING FROM THE RANGE OF 40 TO 44 FOR BUTYRO-REFRACTROMETER READING

S.No.	State/UTs	Chhena based desserts			Khoa based desserts			Total		
		TS	F	%F	TS	F	%F	TS	F	%F
1	ANDHRA PRADESH	17	1	5.9%	41	4	9.8%	58	5	8.6%
2	BIHAR	32	1	3.1%	55	5	9.1%	87	6	6.9%
3	CHANDIGARH	1	0	0.0%	3	0	0.0%	4	0	0.0%
4	CHHATTISGARH	33	1	3.0%	51	8	15.7%	84	9	10.7%
5	DADRA & NAGAR HAVELI	1	0	0.0%	3	0	0.0%	4	0	0.0%
6	DAMAN AND DIU	1	0	0.0%	6	1	16.7%	7	1	14.3%
7	GOA	0	0	0.0%	9	0	0.0%	9	0	0.0%
8	GUJARAT	36	0	0.0%	81	8	9.9%	117	8	6.8%
9	HARYANA	20	0	0.0%	37	1	2.7%	57	1	1.8%
10	HIMACHAL PRADESH	11	0	0.0%	23	0	0.0%	34	0	0.0%
11	JAMMU AND KASHMIR	14	0	0.0%	35	0	0.0%	49	0	0.0%
12	JHARKHAND	29	3	10.3%	41	6	14.6%	70	9	12.9%
13	KARNATAKA	37	3	8.1%	96	16	16.7%	133	19	14.3%
14	KERALA	9	0	0.0%	42	10	23.8%	51	10	19.6%
15	MADHYA PRADESH	35	0	0.0%	108	1	0.9%	143	1	0.7%
16	MAHARASHTRA	40	1	2.5%	97	3	3.1%	137	4	2.9%
17	MANIPUR	14	0	0.0%	24	0	0.0%	38	0	0.0%
18	MEGHALAYA	19	0	0.0%	12	0	0.0%	31	0	0.0%
19	ODISHA	60	4	6.7%	54	8	14.8%	114	12	10.5%
20	PUNJAB	21	1	4.8%	48	0	0.0%	69	1	1.4%
21	RAJASTHAN	1	0	0.0%	10	2	20.0%	11	2	18.2%
22	SIKKIM	5	1	20.0%	10	3	30.0%	15	4	26.7%
23	TAMIL NADU	40	1	2.5%	107	15	14.0%	147	16	10.9%
24	TELANGANA	34	0	0.0%	137	32	23.4%	171	32	18.7%



### FSSAI MILK PRODUCT SURVEY- 2020

25	UTTAR PRADESH	66	0	0.0%	103	1	1.0%	169	1	0.6%
26	UTTARAKHAND	20	0	0.0%	23	0	0.0%	43	0	0.0%
	<b>Grand Total</b>	<b>596</b>	<b>17</b>	<b>2.9%</b>	<b>1256</b>	<b>124</b>	<b>9.9%</b>	<b>1852</b>	<b>141</b>	<b>7.6%</b>

## FSSAI MILK PRODUCT SURVEY- 2020



### ANNEXURE XXV: COMPARISON OF INDICATORS OF MILK PRODUCT SURVEYS CONDUCTED IN 2019 & 2020

Key Indicators	2019	2020
No. of states/ UT covered	1	27
Date duration of sampling	15 October to 07 November 2019	12-13 November 2020
No. of days for sampling	24	2
No. of labs	1	4
No. Samples	733	2801
Over all Non-compliant	95.5%	40.8%
Khoa, % non-compliant	100%	60.6%
Chhena, % non-compliant	100%	56.6%
Paneer, % non-compliant	98%	74.3%
Dessert, % non-compliant	86.50%	27.0%
Chemical tests, % non-compliant	45%	11.0%
BR reading, % Non-compliant	31.90%	6.9% (Khoa)
Heavy metal, % non-compliant	0%	0%
Microbiological tests, % non-compliant	86.50%	37.5%
Hygiene tests, % non-compliant	86.50%	37.4%
Microbiology Safety tests, % non-compliant	2.30%	1.7%

**FSSAI Office Address**

FDA Bhawan near Bal Bhavan, Kotla Road, New Delhi - 110002 India.  
EPABX : 011-23236975. Tele-fax: 011-23220994. Toll-free Number: 1800112100.