



THE ODISHA STATE CO-OPERATIVE MILK PRODUCERS' FEDERATION LTD.

D-2, SAHID NAGAR, BHUBANESWAR-751 007.

Phone: (0674) – 2540273 / 2546030 / 2540417

Tele Fax: (0674)-2540974, E-mail: omfed@yahoo.com

T E N D E R D O C U M E N T

F O R

Supply, Installation, Commissioning & Testing of Laboratory Equipment for STATE CENTRAL LABORATORY at OMFED Dairy Plant, Arilo

Date of Commencement for on line Bidding	03.03.2022, 10 AM onwards
Last Date & Time for Bidding	24.03.2022 (Up to 5.00 PM)
Date & time for receipt of the hard copies of Demand Draft for paper cost & EMD	03.03.2022 to 24.03.2022 (10.00 AM to 4.00 PM)
Date & Time of opening of Technical Bid (After evaluation of Technical Bid, the date of opening of Commercial Bid shall be informed to the qualified bidders)	25.03.2022 (11 AM)

RECEIPT OF TENDER PAPERS :
PLACE OF OPENING OF TENDER :
ADDRESS FOR COMMUNICATION :

**THE ODISHA STATE COOPERATIVE
MILK PRODUCERS' FEDERATION LTD
(OMFED)
D-2, SAHIDNAGAR,
BHUBANESWAR- 751007**

The Odisha State Cooperative, Milk Producers' Federation Ltd.

D-2, SAHID NAGAR, BHUBANESWAR-751 007.

Ph No- 2546030 / 2540273 / 2540417, Fax No (0674)2540974



www.omfed.com

The Odisha State Cooperative Milk Producers' Federation Ltd.

D- Sahid Nagar, Bhubaneswar-751007

Ph. No- (0674) 2546030 /2540273/ 2540417,

Fax no (0674) 2540974

TENDER NOTICE

FOR

SUPPLY, INSTALLATION, COMMOSSIONING, TESTING & RUNNING OF LABORATORY EQUIPMENTS AT OMFED DAIRY PLANT, ARILO.

OMFED invites sealed and separate offers for Technical & Commercial bids from reputed Manufacturers/ Distributors for supply, installation, commissioning, testing and running of Laboratory Equipments at OMFED Dairy Plant, Arilo. Tender document can be down loaded from web site www.omfed.com against payment of required amount in shape of Demand Draft drawn in favour of OMFED drawn on any nationalized bank payable at Bhubaneswar. The Tender document should be duly filled & submitted on due date along with the cost of paper .

The sealed technical & commercial bid along with required EMD (inside commercial bid) should reach the above addressed office by Dt.-24.03.2022 up to 2 PM hours. The Bid shall open on 25.03.2022 at 11 AM, in presence of interested bidders. For details please visit our website www.omfed.com

The corrigendum/ amendment to this notice required shall be published only in the OMFED website and will not be published again in newspapers.

OMFED reserves the right to cancel partial or whole tender without assigning any reason thereof.

Sd/-

MANAGING DIRECTOR



The Odisha State Cooperative, Milk Producers' Federation Ltd.
D-2, Sahid Nagar, Bhubaneswar-751 007.
Ph. No- 2546030/2540273/2540417, Fax No (0674)2540974

Bid Identification No. 498 / CSS / NPDD / SL(Vol-II) /

OMFED invites Technical & Commercial offer from original equipment manufacturer or their authorized channel partner for supply, installation, commissioning and testing of the following Laboratory Equipments with Accessories at New Dairy Plant of Omfed. The open tender is invited by OMFED & web. Portal is www.omfed.com . The bidders should have gone through this portal for participating in this open tender.

Sl No	Name of the ITEM	Quantity	Estimated Total Cost (in Lakhs)	Cost of Tender paper (in Rs.)	Availability of tender for on line bidding(Date)		Date of opening	(EMD) (in Lakh)
					From	To		
1	LCMS/MS- Triple Cord Liquid Chromatography/ Mass Spectrometer with accessories	1	200.00	1000.00 + 12% GST	03.03.22	24.03.22	25.03.22	20.00
2	GCMS/MS- Triple Cord Liquid Chromatography/ Mass Spectrometer with accessories	1	100.00	1000.00 + 12% GST	03.03.22	24.03.22	25.03.22	10.00
3	Induced Couple Plasma Mass Spectrometer (ICP-MS) with Accessories	1	100.00	1000.00 + 12% GST	03.03.22	24.03.22	25.03.22	10.00
4	FTIR Technology based Milk Analyser	1	85.00	1000.00 + 12% GST	03.03.22	24.03.22	25.03.22	8.50

5	Bacteria and Somatic Cell Analyser	1 set	70.00	1000.00 + 12% GST	03.03.22	24.03.22	25.03.22	7.00
6	Electronic Milk Analyzer with Adulteration Testing Facility	1	4.00	500.00 + 12% GST	03.03.22	24.03.22	25.03.22	0.40
7	Automatic Kjeldhal Unit	1	3.50	500.00 + 12% GST	03.03.22	24.03.22	25.03.22	0.35
8	Laminar Air Flow	1	2.50	500.00 + 12% GST	03.03.22	24.03.22	25.03.22	.025
9	Sodium Potassium Analyzer	1	1.80	500.00 + 12% GST	03.03.22	24.03.22	25.03.22	.0.18
10	GERBER Centrifuse	1	1.20	500.00 + 12% GST	03.03.22	24.03.22	25.03.22	0.12
11	Analytical Weighing balance 220 g (0.001)	1	1.20	500.00 + 12% GST	03.03.22	24.03.22	25.03.22	0.12
12	Other Laboratory Equipment as per list (Annexure-I)	1 each	6.54	500.00 + 12% GST	03.03.22	24.03.22	25.03.22	0.12

1. Specifications of the equipments is attached.

2. Bid documents consisting of specifications, the schedule of quantities and the set of terms and conditions of contract and other necessary documents can be seen and downloaded in the website: www.omfed.com. The corrigendum/amendment to this notice if required shall be published only in the OMFED web site www.omfed.com and will not be published again in news paper.

3. The **Bid documents for bidding will be available** in the website: www.omfed.com from **03.03.2022 to 24.03.2022 (10.00 AM to 5.00 PM)**

4. (i) The tender paper cost (in shape of D/D) & EMD (in shape of D/D) in original, to be submitted

(ii) Photo Copy of GST, PAN, Registration Certificate of firm, Experience Certificate, other documents as per detail tender call notice(DTCN) with duly signed by the bidder (Only Papers relating to Technical Bid) is to be submitted.

As mentioned **4 (i) & (ii)** shall have to be deposited in two different sealed envelopes within **10.00 A.M. of 03.03.2022 to 05:00PM of 24.03.2022** at the OMFED Corporate office, Bhubaneswar.

Non submission of cost of bid document and bid security within the period shall debar from participating.

5. Bids shall be received only **on or before 5.00 PM of 24.03.2022**

6. Bids received shall be opened (technical) **on 25 .03.2022 (11 AM)** at OMFED Corporate office in the presence of the bidders. If the office happens to be closed on the last date of opening of the bids as specified, the bids will be opened on the next working day at the same time and venue.

7. The cost of bid documents & EMD in demand draft issued from any **Nationalized Scheduled Bank may be prepared in favour of OMFED, payable at Bhubaneswar.**

8. The Co-operatives, Govt. bodies, NSIC and MSME registered firms are exempted from submitting required EMD.

9. Other details can be seen in the bidding documents.

10. The Financial bid will be opened among the qualified technical bidders & it will be intimated in due time

11. The management reserves the right to cancel any or all bids without assigning any reason thereof.

12. Any corrigendum / addendum will be displayed only in the OMFED web site (www.omfed.com)

13. Defaulters in earlier supply to Omfed or Black listed anywhere in the country are not allowed to participate in the tender.

14. Jurisdiction – The court at Bhubaneswar alone will have jurisdictions for any legal dispute which may arise out of this tender

Sd/-

Managing Director,

OMFED

GENERAL TERMS & CONDITIONS:

1. Eligibility Criteria

1.1 The manufacturing company should provide after sale service for the supplied Laboratory items.

1.2 The average annual sales turnover of the manufacturing company detailed out below.

Sl no	Item Description	Minimum Average Annual sales turn over (Rs) for the year 2018-19 to 2020-21
1	LCMS/MS- Triple Cord Liquid Chromatography/ Mass Spectrometer with accessories	20.00 Crore
2	GCMS/MS- Triple Cord Liquid Chromatography/ Mass Spectrometer with accessories	10.00 Crore
3	Induced Couple Plasma Mass Spectrometer (ICP-MS) with Accessories	10.00 Crore
4	FTIR Technology based Milk Analyser	8.50 Crore
5	Bacteria and Somatic Cell Analyser	7.00 Crore
6	Electronic Milk Analyzer with Adulteration Testing Facility	40.00 Lakhs
7	Automatic Kjeldhal Unit	35.00 Lakhs
8	Laminar Air Flow	25.00 lakhs
9	Sodium Potassium Analyzer	18.00 Lakhs
10	GERBER Centrifuse	12.00 Lakh
11	Analytical Weighing balance 220 g (0.001)	12.00 Lakh
12	Other Laboratory Equipment as per list (Annexure-I)	65.40 akh

1.3 The bidder should have supplied above laboratory equipments to different Milk Unions/Milk Federations/Dairy Plants for the year 2018-19 to 2020-2021 & should submit the proof along with the copy of Purchase Order.

2. Specification: Each supply of these laboratory equipments must conform to the Technical Specification enclosed as **Annexure – II to Annex.- XII**

3. Quantity Requirement: 1 unit each

3.1 The quantity may vary and will be as per rate that will be finalised & at the discretion of OMFED.

4. Offer Price/Rate: Quoted price should be inclusive of all taxes, transport, insurance charges, installation, commissioning, Training etc.

4.1 In case there is any increase/reduction in Government taxes, excise, levies, the same will be made effective immediately.

5. Delivery Time: Supply, commissioning, testing & running within **60 days** from the date of acceptance of the order directly at site.

05.1. The default penalties during deliveries of goods at all destination/site shall be in your accounts and no any extra charges paid for the same.

05.2. The goods to be supplied, shall be fully insured by supplier against loss/damage incidental to manufacturer or acquisition, transportation, storage and delivery in the manner specified in the condition.

05.3. If any loss/damage occurs, the supplier shall make arrangement for repair and replacement of the same within the stipulated time.

6. EMD/Security deposit:

06.1. You are required to pay EMD/security deposit **as given in table against respective item**, by demand draft drawn in favour of OMFED, Bhubaneswar as per the terms of the business.

06.2. This EMD/Security Deposit will carry no interest & shall be refunded only after completion of orders/contract satisfactorily and after obtaining clearance certificate from member unions that there are no outstanding dues to be recovered from you.

7. Change in terms, conditions & specifications: In case of any midyear change in terms, conditions & specifications decided by OMFED management, we reserve the right to cancel the contract with you in part or in full. However, in such instance, we shall provide you with adequate notice period.

8. Inspection: OMFED reserves the right to depute either our representatives or representatives of our member-unions or of any independent body for inspection of materials while the same are under manufacturing, installation/commissioning etc. To facilitate inspections as and when necessary, you will be required to give prior intimation as to when you are likely to finish manufacturing of equipments. In case during such inspection the result is found unsatisfactory, we reserve the right to take whatever action is necessary to protect our interests. However; at our destination we may decide not to carry the inspection. But we may rely on the certificate of the supplier confirming that equipments manufactured as per the laid down specifications & standards.

9. WARRANTEE:

09.1 Warrantee shall remain for 12 months from the date of installation commissioning of units. The supplier warrantee that the goods supplied against purchase order are new, unused and incorporation all recent improvement in design and materials. Supplier's warrantee certification should be provided along with each supply.

09.1.1 These laboratory equipments shall be covered under one-year free service after expiry of warrantee period

09.2 Suppliers shall provide warrantee to replace without any extra cost of goods if found manufacturing defect /not suitable for use due to bad quality, use of substandard materials etc, when brought to notice within 12 months of warrantee from the date of installation / commissioning of units. The cost of sending the unacceptable /un suitable materials or part thereof for replacement shall be borne by the suppliers, if any.

10. Terms of payment:

- Bills in triplicate shall be submitted along with a copy of P.O.
- 60 % on safe receipt of material at site.
- 30 % after successful commissioning/testing & running/report of equipment supplied.
- PSD @ 10 % of billed value shall be retained by ordering authority for a period of 02 years from the date of successful commissioning and shall be released subject to satisfactory performance.
- Any other statutory deduction like TDS etc. as applicable

11. Penalty:

Penalty @ 0.5 % of the order value per week shall be imposed for delay in execution beyond the time frame. The penalty amount will be Limited to 10% of the order value.

12. Documents to be submitted in technical bid:

- Certificate from the clients with detail contact address to establish supply of the items.
- Proof of sales turn over (Audited Profit & Loss Account) with copy of P.O. for 2018-19 to 2020-21.
- Undertaking by the bidder that the bidder is not black listed by any Co-operative Milk Union/ State Milk Federation/Govt. Agencies.
- Audited profit and loss account for the year 2017-18 to 2019-20,
- IT returns for the financial year 2019-20.
- Credentials in support of supply of these laboratory equipment's.
- Performance certificate issued by the clients are to be furnished.
- Demand Draft towards tender paper cost.
- Demand Draft towards EMD.
- Printed technical literature / catalogue of these laboratory equipment
- Duly filled in Manufacturers' authorization letter (for authorized channel partner)
- Xerox copies of PAN / GST.
- Valid NSIC/MSME certificate holders are exempted from the EMD (subject to submit the copy of said certificate for verification).

13. Other Terms and Condition:

- The bidder cannot stipulate any terms and condition of his own beyond the tender requirements.
- The bid shall be rejected if not completed with tender requirement.
- All statutory approval is within the scope of the bidder.
- It is mandatory on the part of bidder to quote for the entire item as mentioned in the BOQ failing which the offer shall not be considered.
- All the required documents relating to Technical bid should be uploaded online.

14. VALIDITY OF OFFER:

01 year from the date of notification.

Signature:

Seal:

Date:

TECHNICAL BID FORMAT FOR
The Laboratory Equipments with Accessories

SL NO	Description	Details
1	Name of the Company	
2	Office address	
3	Phone no Fax No.	
4	Corporate Head Quarter address& Contact no	
5	Local office address & Contact no in Odisha.	
6	Web site Address.	
7	Nature of the Ownership.	
8	Firm Registration No with date	
9	Details of Statuary Certificate / License/ Clearance.	
10	GST Registration No	
11	GSTIN No	
12	PAN no	
13	DD for EMD	
15	DD for Tender Cost.	
15	ISO Certification no/ Validity	

Signature with seal:

Date:

COMMERCIAL BID FOR

The Laboratory Equipments with Accessories

SI No	Name of Item	Quantity	Unit Price (in Rs.)	Total GST Amount	Total Amount with all taxes	Total Amount with taxes (F.O.R)
1	LCMS/MS- Triple Cord Liquid Chromatography/ Mass Spectrometer with accessories					
2	GCMS/MS- Triple Cord Liquid Chromatography/ Mass Spectrometer with accessories					
3	Induced Couple Plasma Mass Spectrometer (ICP-MS) with Accessories					
4	FTIR Technology based Milk Analyser					
5	Bacteria and Somatic Cell Analyser					
6	Electronic Milk Analyzer with Adulteration Testing Facility					
7	Automatic Kjeldhal Unit					
8	Laminar Air Flow					
9	Sodium Potassium Analyzer					
10	GERBER Centrifuse					
11	Analytical Weighing balance 220 g (0.001)					
12	Other Laboratory Equipment as per list (Annexure-I)					

Signature with Seal:

Date:

Annexure - I

List of Other Laboratory Equipments

Sl No	Material Description	Approx. Cost (Rs./Unit)
1	Auto Clave	0.50
2	Double Distillation Unit	0.40
3	Electric Mixer (1400 Rpm)	0.05
4	Fire Extinguisher	0.05
5	Water bath 37 deg C with Auto Thermostat	0.30
6	Hot Air Oven 100 deg C	0.40
7	Hot Air Oven 250 deg C	0.50
8	Hot plate with Top body SS 304	0.20
9	Incubator 37 deg C	0.60
10	PH meter	0.40
11	Refractometer	0.50
12	Remi Centrifuge	0.30
13	Weighing Balance 1.5 kg (0.1 g)	0.20
14	Thermometer	0.02
15	Vernier Caliper	0.05
16	Air conditioner Split Type	0.50
17	Gas Cylinder + Oven	0.03
18	Muffle Furnace	0.50
19	Turbidity Meter	0.50
20	Refrigerator	0.50
21	Adulteration Kit (1 unit)	0.04
Total		6.54

SPECIFICATION OF LABORATORY EQUIPMENT

Sl no	Item Description	Specification No	Annexure No
1	LCMS/MS- Triple Cord Liquid Chromatography/ Mass Spectrometer with accessories	Specification - 1	Annexure - II
2	GCMS/MS- Triple Cord Liquid Chromatography/Mass Spectrometer with accessories	Specification - 2	Annexure - III
3	Induced Couple Plasma Mass Spectrometer (ICP-MS) with Accessories	Specification - 3	Annexure - IV
4	FTIR Technology based Milk Analyser	Specification - 4	Annexure - V
5	Bacteria and Somatic Cell Analyser	Specification - 5	Annexure - VI
6	Electronic Milk Analyzer with Adulteration Testing Facility	Specification - 6	Annexure - VII
7	Automatic Kjeldhal Unit	Specification - 7	Annexure - VIII
8	Laminar Air Flow	Specification - 8	Annexure - IX
9	Sodium Potassium Analyzer	Specification - 9	Annexure - X
10	GERBER Centrifuge	Specification - 10	Annexure - XI
11	Analytical Weighing balance 220 g (0.001)	Specification - 11	Annexure - XII

Technical Specifications of Liquid Chromatography coupled with Triple Quadruple Mass detector (LC-MS/MS)

Sr. No	Parameters	Technical specifications
1		Application
1.1	Instrument details	A bench top highly sensitive LC-MS/ MS system with all accessories, consumables etc. required for the analysis of pesticide residues, mycotoxins , contaminants and veterinary drug residues. The instrument shall have capability to quantify at 1/ 4th of the Maximum Residue Limits of analytes set by FSSAI for milk and milk products.
2		Mass spectrometer
2.1	Mass range	Minimum 5-2000 amu
2.2	Scan speed	Minimum 12000 amu / sec
2.3	Ionization source	The instrument should have Electro spray Ionization source There should be a provision to divert the flow to waste / MS through software before / during/ after the analysis
2.4	Mass resolution	Less than 0.7 amu over the entire mass range in both the Quadruples .
2.5	Sensitivity	ESI + ve mode : Minimum S/ N 5,00,000:1 without smoothing using 1pg of reserpine on column injection ESI -ve mode: Minimum S/ N 5,00,000:1 without smoothing using 1 pg chloramphenicol on column injection
2.6	Collision cell	MS-MS capability must be available in Q2 / MS2 via collision induced dissociation (CID) and the design should be specified and be such as to eliminate cross talk
2.7	MRM dwell time	1 ms or less
2.8	Dynamic range	Minimum 6 orders of magnitude
2.9	Polarity switching time	25 ms or less
2.10	Desolvation temperature	Minimum 575°C
2.11	Minimum Operating modes	(I) Full scan (II) Product ion scan (III) Precursor ion scan (IV) Neutral loss scan (V) Multiple Reaction Monitoring (MRM)
2.12	Fluidics system	An infusion device must be integral to the instrument and must be controllable from the instrument software
2.13	Detector	Dynolite photomultiplier. If any other detector is offered , it shall have minimum 6 years life or sufficient no. of detectors for 6 years of operation should be offered
2.14	Nitrogen generator	Nitrogen Generator with noise free inbuilt compressor should be offered
3		Liquid Chromatography
3.1	UHPLC system	Analytical UHPLC system equipped with temperature controlled auto sampler, thermostat column compartment and degasser shall be provided
4		Pump
4.1	Pump	Quaternary pump with low pressure mixing capable of switching between the solvents
4.2	Degasser	Vacuum degassing capability with minimum four channels

4.3	Flow rate	Operating flow rate range shall be 0.01 to 2 ml/ minute
4.4	Operating pressure	Maximum Operating pressure shall be minimum 15000 psi or more
4.5	Flow rate precision	RSD \pm 0.075 % or less
4.6	Flow accuracy	\pm 1%
5		Autosampler
5.1	Vial capacity	Autosampler should be available with the capacity of placing minimum 90 vials of 1-1.5 ml volume
	Injection volume range	1-10 μ l or better
5.3	Injection volume precision	Maximum RSD \pm 0.3 %
5.4	Autosampler Temperature	Temperature controlled autosampler compartment ranging from 4-20°C or better
6		Column compartment
6.1	Column oven	Ambient temperature to minimum 60°C
		Switching between two columns should be available for running two different methods one after another
7		Computer system
7.1	System	Factory fitted Windows based computer system for Acquisition and processing should be offered
7.2	Minimum configuration of Acquisition PC	Latest model of computer with following specifications
		Monitor: Minimum 24" or better
		RAM minimum 32 GB or better as per the equipment requirement
		Hard drive: Minimum 2 TB or better as per the equipment requirement
		Wireless mouse and keypad should be supplied
		Laser jet automatic duplex printer should be provided
8		Software
8.1	Latest software	Software should have following features
		1. Interrogate the data for peak quality, peak ratios, and other parameters.
		2. Create and edit quantitation methods quickly
		3. Should have algorithm that integrates chromatographic peaks with exceptional consistency and accuracy- especially in cases of low level peaks and difficult baselines
		4. Flagging of non-compliance
9		Basic utilities
9.1	Installation requirements	Pre-installation requirements in the form of tables, power points, LAN connections shall be indicated in the specifications.
		A suitable exhaust system with complete installation and testing charges should be included. Bidders are encouraged to visit the site for actual assessment of work.
9.2	Installation	The installation to be done at OMFED Dairy, while ensuring all the criteria for compliance as per specification are met and demonstrated. All required accessories, columns; calibration solutions should be included for this activity.
9.3	IQ/ OQ/ PQ	Supplier shall perform and provide the required documents of IQ/ OQ/ PQ during these tests during the installation.
10		Warranty & AMC

		<p>The warranty of equipment would be extended by a month, if equipment has been down for more than 10 days in a year, whereas, warranty of equipment would be extended by 1 year, if equipment has been down for more than 30 days due to malfunctioning of any part supplied by bidder during warranty period.</p>
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<p>10.1</p>	<p>Warranty</p>	<p>Supplier shall provide comprehensive warranty for one year from the date of installation covering all parts of offered solution including CPU and Monitor and conduct preventive maintenance during the period as per defined schedule</p>
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10.2	AMC	1 year free comprehensive maintenance be provided and AMC charges from 3 rd year onwards should be quoted separately.
11		Training
11.1	Operation and Application training	One week training at State Central Lab after installation of LC-MS/ MS on all software features, and instrument troubleshooting/ maintenance and operation.
		One week application training within a month of installation on method development, tuning of new analyte, reading of the mass spectra and application of the advanced software features.
12		Service
12.1	Local service facility	The supplier shall have service facility and trained engineers to provide breakdown services within 24-48hrs of complaint registration.
		Supplier shall be responsible for providing the service during the warranty and AMC period for the instruments and accessories offered from other manufacturers.
12.2	Stock inventory	The supplier shall keep inventory of spares and consumables in India for the repair of equipment. Kindly submit the undertaking for the same.
12.3	Number of installations	The supplier shall provide a list of installations of quoted model in food testing laboratories from government and private sector during last three years with contact details.
1		Performance verification
13.1	Demonstration	We reserve the right to verify the performance of equipment with Check samples for accuracy, precision, speed, recovery etc. as per globally acceptable criterion through a demonstration at vendor's facility or at any installation to be arranged by vendor
		The bidder has to arrange all the pre-requisite for the demonstration/ performance verification which may involve analysis of reference sample or spiked samples
		Travel expenditure for such a verification visit will be borne by us.
	Compliance	The bidders are requested to provide point wise compliance for each point in specification along with documentary evidences.
		The traceability of compliance information in submitted offer shall be clearly indicated.
		The offer with incomplete/ untraceable information may not be considered.
		User list with minimum 3 performance certificates must be provided along with the contact details for the quoted model
13.3	No offering of refurbished / assembled / demo modules	No part of the offered instrument shall be refurbished or used in demonstration purpose for which undertaking must be submitted.
13.4	Method set up and standardisation	Bidder shall depute the application personnel to standardize methods at 1/4 th the MRL for following analytes.
		A) pesticides and veterinary drug residues in milk and milk products as per FSSAI and EiC RMP (List of LC amenable compounds is attached).
		B) Aflatoxin M1 in milk at 0.1 ppb and B1 in Feed at 2 ppb respectively.
		C) Melamine in milk and milk products at 0.5 ppb
13.5	Column requirement	The specific columns required for applications in Sr. no.13.4 should be offered in duplicate.
14	General Conditions	It is the responsibility of vendor to supply a complete solution/ unit for the analysis.
		Vendor should be able to supply all the spares / consumable required for repair at least 8-10 years after installation

Pesticide in Milk and Milk Products as per FSSAI

	Name of the Insecticide	Food	Maximum Residue Limit in mg./kg.	Equipment
01.	2,4-Dichlorophoxy Acetic Acid	Milk & Milk Products	0.05	LCMS
02.	Accphate (expressed as mixture of Mathamidophos and accphate)	Milk & Milk Products	0.02.	LCMS
03.	Acctamiprid	Milk & Milk Products	0.02	LCMS
04.	Azoxystrobin	Milk & Milk Products	0.01	LCMS
05.	Sum of bcnomyl and carbendazim expressed as carbendazim	Milk & Milk Products	0.01 (F)	LCMS
06.	Bifenthrim	Milk & Milk Products	0.20	GCMS
07.	Bitertanol	Milk & Milk Products	0.05	LCMS
08.	Buprofezin	Milk & Milk Products	0.01	LCMS
09.	Carbaryl	Milk & Milk Products	0.05	LCMS
10.	Carbendazim	Milk & Milk Products	0.01 (F)	LCMS
11.	Carbofuran (Sum of carbofuran and 3-hydroxy carbofuran expressed as	Milk & Milk Products	0.05 (fat basis)	LCMS
12.	Chlorantraniliprole	Milk & Milk Products	0.05	LCMS
13.	Chlorothalonil	Milk & Milk Products	0.07	GCMS
14.	Chlorpyriphos	Milk & Milk Products	0.02	GCMS
15.	Chlothianidin (Chlothianidin and its metabolites Thiazolymethy lguanidine)	Milk & Milk Products	0.02	LCMS
16.	Cypermethrin (Sun of isomers) (Fat soluble residue)	Milk & Milk Products	0.05	GCMS
17.	Deltamethrin (Decamethrin)	Milk & Milk Products	0.05	GCMS
18.	Dichlorvos (DDVP) (Content of diloroacetalde hyde (D.C.A) be	Milk & Milk Products	0.01	GCMS
19.	Ditenoconazole	Milk & Milk Products	0.02	GCMS
20.	Dimethoate	Milk & Milk Products	0.05	LCMS
21.	Dinotefuran	Milk & Milk Products	0.01	LCMS
22.	(c) Mancozeb	Milk & Milk Products	0.05	GCMS
23.	(d) Metiram as 9CS2)	Milk & Milk Products	0.05	GCMS
24.	Edifenphos	Milk & Milk Products	0.01 (F)	LCMS

25.	Emamectin Benzoate	Milk & Milk Products	0.01*	LCMS
26.	Ethion (Residues to be determined as ethion and its oxygen analogue)	Milk & Milk Products	0.5 (F)	LCMS
27.	Ethofenprox (Etofenprox)	Milk & Milk Products	0.02	GCMS
28.	Fenpropathrin	Milk & Milk Products	0.01	GCMS
29.	Fenvalerate (Fat Soluble residue)	Milk & Milk Products	0.01 (F)	GCMS
30.	Fipronil	Milk & Milk Products	0.02	GCMS
31.	Flubendiamide	Milk & Milk Products	0.01	LCMS
32.	Flusilazole	Milk & Milk Products	0.05	LCMS
33.	Glufosinate Ammonium	Milk & Milk Products	0.02	LCMS
34.	Imidacloprid	Milk & Milk Products	0.01	LCMS
35.	Indoxacarb	Milk & Milk Products	0.01	LCMS
36.	Kresoxim Methyl	Milk & Milk Products	0.01	LCMS
37.	Methomyl	Milk & Milk Products	0.02	LCMS
38.	Methyl Chlorophenoxy Acetic Acid (MCPA)	Milk & Milk Products	0.04	LCMS
39.	Metolachlor	Milk & Milk Products	0.01*	LCMS
40.	Monocrotophos	Milk & Milk Products	0.02	LCMS
41.	Oxydemeton- Methyl	Milk & Milk Products	0.01	LCMS
42.	Paraquat dichloride (Determined as paraquat cations)	Milk & Milk Products (Whole)	0.01	LCMS
43.	Penconazole	Milk & Milk Products	0.01	LCMS
44.	Phenthoate	Milk & Milk Products	0.01 (F)	LCMS
45.	Phorate (Sum of phorate, its oxygen analogue and their sulphoxides and	Milk & Milk Products	0.05 (F)	GCMS
46.	Pirimiphos methyl	Milk & Milk Products	0.05 (F)	
47.	Propiconazole	Milk & Milk Products	0.01	LCMS
48.	Pyraclostrobin	Milk & Milk Products	0.03	LCMS
49.	Tebuconazole	Milk & Milk Products	0.01	LCMS
50.	Thiacloprid	Milk & Milk Products	0.05	LCMS

51.	Thiamethoxam	Milk & Milk Products	0.05	LCMS
52.	Thiophanate-methyl	Milk & Milk Products	0.05	LCMS
53.	Trichlorfon	Milk & Milk Products	0.05	LCMS
54.	Triaccontanol	Milk & Milk Products	0.01	LCMS
55.	Triadimefon	Milk & Milk Products	0.01*	LCMS

Antibiotics in Milk as per FSSAI		
Sr. No.	Name of compound	MRL µg/kg
1	4-epi-chlortetracycline	100
2	4-epi-oxytetracycline	100
3	4-epi-tetracycline	100
4	Albendazole	100
5	Ampicillin	10
6	Apramycin	10
7	Cefphacetrile	10
8	Ceftiofur	100
9	Clortetracycline	100
10	Diminazene	150
11	Doramectin	15
12	Febantel	100
13	Fenbendazole	100
14	Flunixin	10
15	Ivermectin	10
16	Lineomycin	150
17	Meloxicam	10
18	Monensin	2
19	Neomycin	1500
20	Oxfendazole	100
21	Oxyclozanide	10
22	Oxytetracycline	100
23	Parbendazole	10
24	Praziquantel	10
25	Spectinomycin	200
26	Sulfachlorpyridazine	10
27	Sulfadiazine	10
28	Sulfadimidine	10
29	Sulfanilamide	10
30	Sulfaquinoxaline	10
31	Tetracycline	100
32	Thiabendazole	100
33	Trimethoprim	10
34	Tylosin	100
35	Virginiamycin	10

Antibiotics in Milk as per EIC

Sr. No.	Name of compound	MRL/MRPL* µg/kg
1	3-amino-5-morpholinomethyl-2-oxazolidinone (AMOZ)	10
2	4-epi-chlorotetracycline	100
3	4-epi-oxytetracycline	100
4	4-epi-tetracycline	100

5	Albendazole	100
6	Albendazole 2-amino sulphone	100
7	Albendazole sulphone	100
8	Albendazole sulphoxide	100
9	Aminohydantoin (AHO)	1•
10	Amino-Oxazolidinone (AOZ)	1•
11	Amoxicillin	4
12	Ampicillin	4
13	Cefacetrile	125
14	Cefalexin	100
15	Cefalonium	20
16	Cefapirin	60
17	Cefoperazone	50
18	Cefquinome sulphate	10*
19	Ceftiazone	10*
20	Ceftiofur	100
21	Cefuroxime sodium	10*
22	Cephalosporin	10*
23	Chloramphenicol	0.3*
24	Chlorotetracycline	100
25	Ciprofloxacin	100
26	Cloxacillin	30
27	Dicloxacillin	30
28	Dihydrostreptomycin	200
29	Diminazene	10*
30	Doxycycline	10*
31	Enrofloxacin	100
32	Erythromycin A	40
33	Fenbendazole	10
34	Fenbendazole sulphone	10
35	Gentamicin	100
36	Ivermectin	1•
37	Kanamycin A	150
38	Meloxicam	15
39	Metronidazole	1•
40	Morantel	50
41	Nafcillin	30
42	Neomycin B	1500
43	Neospiramycin	200
44	Oxacillin	30
45	Oxfendazole	10
46	Oxytetracycline	100
47	Penicillin G	4
48	Phenyl Butazone	1*
49	Praziquantel	10*
50	Ronidazole	1•
51	Semicarbazide (SEM)	1•
52	Spectinomycin	200
53	Spiramycin	200
54	Streptomycin	200
55	Sulbactam	10 •
56	Sulfachlorpyridazine	100
57	Sulfadiazene	100
58	Sulfadimethoxine	100
59	Sulfadimidine	100
60	Sulfadoxine	100
61	Sulfamethazine	100
62	Sulfamethiazole	100
63	Sulfamethoxypyridazine	100
64	Sulfamirazene	100
65	Sulfanilamide	100
66	Sulfathiazole	100
67	Taxobactam	10 •

68	Tetracycline	100
69	Thiamphenicol	50
70	Tilmicosin	50
71	Tinidazole	10 •
72	Trimethoprim	50
73	Tylosin A	50

Annexure- III

Specification of GC-MS/MS with FID		
Sl No.	Features/ Particulars	Specification/ Description
1.	Application	
1.1	Equipment Configuration	A. A Latest and highly sensitive Gas Chromatograph with tripe/ Tandem quadruple mass spectrometer system required with software, auxiliary equipment, accessories and data base.
1.2	Area of analysis	The equipment shall have capability to quantify at 1/4 th of the maximum residue limit set by national and international regulatory authority for milk and milk products. <ul style="list-style-type: none"> a. Analysis of pesticides in milk and milk products as per FSSAI. b. Milk fat purity by Triglycerides as per ISO 17678/2010 on GC-FID c. Fatty acids in milk and milk products
2	Gas Chromatograph (GC)	
2.1	Compatibility/capabilities	<ul style="list-style-type: none"> a. A benefit top gas chromatograph system shall be compatible with offered mass spectrometer, Flame Ionization detector (FID), Auto sampler, Inlets (02 nos), columns (min 3 Nos.) and all other necessary consumables for operation of one year. b. Oven of Gas chromatograph shall have enough space to install two columns and other accessories.
2.2	Gas Supplies	<ul style="list-style-type: none"> a. The gases and flow rate requirements on 24 hrs. of continuous working shall be specified with the offer. b. The purification filters required for all the gases to be used in equipment shall be included c. System shall have Electronic pneumatic/ pressure controls of all the gasses.
2.3	Auto sampler	<ul style="list-style-type: none"> a. Auto sampler automatic injection devices with minimum 15 or more vial tray. b. It shall have reproducibility < 0.5% RSD when injected Iul. c. Auto sampler shall have provision for minimizing the carry over. It shall have facility to wash syringe with more than two solvents before and after the injections.
2.4	Inlet (2 No's)	<ul style="list-style-type: none"> a. System should be offered with two inlets <ul style="list-style-type: none"> 1) MMI/PTV for pesticide analysis 2) On Column injector for Triglyceride analysis or any other suitable inlet for triglycerides analysis as per ISO 17678:2010 subject to successful demonstration. b. System shall have advanced electronic flow control modules with Pressure set points adjustable in increments of 0.01 psi or better, with typical control a 0.01 or better for the range 0.000 to 140 psi for both injectors.

		<p>c. System shall be easy to perform maintenance activities like removal of liner, changing of septa, o rings</p> <p>d. System shall have total flow setting range for N₂ to be 0-200 ml/min while he 1200ml/min</p>
2.5	Column Oven	<p>a. System shall have provision to install two columns simultaneously during routine work</p> <p>b. Operating temp range of oven from near ambient to 450°C</p> <p>c. Support 15 oven ramps or better in a single run</p> <p>d. Ramp rate shall go up to 100°C/min or more</p> <p>e. Supplier shall supply</p> <p>1) Two suitable columns for pesticides (30 Meter Length) for use on GCMS/MS.</p> <p>2) One suitable column for Fatty Acid-100 M Length.</p> <p>3) One suitable column for Triglyceride analysis- 5 Meter Length, 0.53 mm ID; 0.17Um with non-polar stationary phase (as per ISO 17678:2010)</p>
2.6		<p>a. GC should have facility of retention time locking/or other suitable equivalent mechanism to avoid change in retention times.</p>
		<p>b. The system should have independently heated GC-MS/MS interface to avoid loss in analytes due temperature gradient in after elution from column.</p>
3	Mass Spectrometer	
3.1	Ion Source	<p>a. The equipment quoted with EI mode of ionization.</p>
		<p>b. The system shall have ability to program ion source temperature up to 350 °c or better</p>
3.2	Mass filters/analyser	<p>a. Triple quadruple with suitable mechanism for calibration, auto tune, compound optimisation, quantitation and confirmation</p>
		<p>b. Quadruple shall be made up of inert material to have better mass transfer efficiency and shall have provision for keeping quadruple clean from dirty matrix</p>
		<p>c. Collision Energy must be selectable up to 60eV</p>
		<p>d. System shall analyse masses from 10 to 1050 AMU</p>
		<p>e. Scan speed up-to 20000 dalton/ sec (u/s) or better .</p>
		<p>f. Mass stability should be up to 0.10 amu / 24 hrs or better</p>
		<p>g. MRM speed (transitions/sec) 800 or more enabling automatically quantifying and confirming more targets in a single method run.</p>
		<p>h. Minimum MRM Dwell Time must be at least 0.5msec</p>
3.3	Detector	<p>a. System should have Electron multiplier detector or photo multiplier detector with Jong life and better sensitivity .</p>
		<p>b. It shall have digital dynamic range <! 1 X 10⁶ or better</p>
3.4	Calibration of mass spectrometer	<p>a. Mass spectrometer shall have suitable mechanism for injecting the calibration solution for calibration system .</p>
		<p>b. Manufacturer shall provide calibration of the instrument quarterly during warranty period.</p>
3.5	Acquisition mode	System shall be capable of acquiring data in full scan, product ion scan, selected ion monitoring and multiple reaction monitoring.
3.6	Sensitivity	EI MRM Sensitivity: 1ul of 100 fg/ ul

		octafluoronaphthalene (OFN) RMS S/ N minimum 30,000: 1 for MS/MS transition of m/z 272-+222 or Numerically equivalent, if estimated by injecting different amount of concentration of OFN.
3.7	Vacuum System	a. The pumps in required numbers to be offered to meet the instrument vacuum requirement and sensitivity.
		b. All accessories required for the proper functioning of vacuum system shall be supplied.
		c. Vacuum system shall have proper venting/exhaust system to remove effluents from pumps and sample split out of laboratory .
4	Flame Ionisation Detector	
	FID	a. Compatible with capillary columns of different diameters
		b. Shall have Flame out detection and automatic re-ignition facility
		c. Minimum Detectable Level (MDL):< 1.5 pg C/s for tridecane
		d. Linear dynamic range: > 10 ⁷
		e. Temperature: 440 °C or More
		f. Standard electronic pneumatic control for three gases i.e. Air; Hydrogen and Makeup gas (N ₂ or He) shall be available for operation .
5	Computer Work station with System Software	
5.1	Computer work station	Latest model of branded computer with preloaded software, laser jet duplex printer shall be offered. The monitor shall have large screen preferably of 24 inches or better.
5.2	Software	a. Preloaded fully automated data acquiring & processing software for with original Software CD and license number of Software shall be supplied with the system.
		b. Software shall have control over all operations of Auto sampler, gas chromatography, mass spectrometer and printer simultaneously or separately.
5.3	Software features	a. Software shall have necessary functions to carry out data acquisition peak integration, quantification for accurate quantitation and confirmations of the analytes of interest/ indicating ion ratios.
		b. Software shall perform simultaneous SIM and SCAN mode of data acquisition.
		c. Software shall have auto flagging facilities in certain parameters as
		1. Auto flagging for the ion ratio which falls out of the confirmation criteria
		2. Auto flagging for the concentration which is falling below limit of quantitation
		3. Auto flagging for recovery/ QC values which is falling out of the defined range of acceptance

5.4	Databases / Libraries	<p>a. Bidder shall provide a database of GC amenable compounds like Pesticides, PCBs, PAH, Dioxins, other contaminants etc. Database should have information like molecular formula, mono isotopic mass, parent and daughter ions cone voltage, collision energy, and other parameters required to standardise analysis method for any compound</p> <p>b. NIST Library.</p>
6	Calibration solution/standards, consumables and accessories	
6.1	Toolkits/ consumable kits/calibration kit/spares	The supplier shall include and specify the kits of relevant equipment parts and accessories along with tool kit.
6.2	Calibration solution/ standards	All calibration standards for mass spectrometer / gas chromatograph / auto sampler shall be offered .
7	Installation	
7.1	Pre-installation	The party need to submit the pre-installation requirement with the offer
7.2	Installation	The installation to be undertaken while ensuring all the criteria for compliance as per specification are met and demonstrated .
7.3	IQ/OQ/PQ	Supplier shall perform all these tests during the installation .
8	Warranty	
8.1	Warranty	Supplier shall provide comprehensive warranty for one year covering all parts of equipment. The warranty of equipment would be extended by a month, if equipment has been down for more than 10 days in a year, whereas, warranty of equipment would be extended by 1 year, if equipment has been down for more than 30 days due to malfunctioning of any part supplied by bidder during warranty period.
8.2	AMC	1 year free comprehensive maintenance be provided and AMC charges from 3 rd year onwards should be quoted separately.
9	Training	
	Operation and application training	<p>a. One week operational training after installation covering GCMS/ MS; GCFID, software features, instrument troubleshooting and maintenance .</p> <p>b. Supplier shall provide one week application training on method development and standardization</p>
10	Method Set Up	
	Bidder shall develop the methods as per application requirement of tender after installation. It shall Coverequipm	<p>a) Pesticides in two products i.e. Liquid milk and ghee or any product suggested by the end user as per FSSAI requirement for GC amenable pesticides (Refer Sr. no. 14).</p> <p>b) Standardisation of method for analysis of triglycerides profile as per IS017678/2010 in milk, milk products.</p> <p>c) Standardisation of method for analysis of</p>

		fatty acid profile as per AOAC 996.06
11	Service & Supply	
11.1	Local service facility	<p>a. The supplier shall have service facility and trained engineers located in nearby metros to provide breakdown services within 24-48hrs of complaint registration.</p> <p>b. The supplier shall have application laboratory in India to support the application requirement and training needs.</p> <p>c. Supplier shall be responsible for providing the service during the warranty and AMC period for the instruments and accessories offered from other manufacturers also.</p>
11.2	Stock inventory	The supplier shall keep inventory of spares and consumables in India for the repair of equipment.
11.3	Number of installations	The supplier shall provide a list of installations of GC- triple quadruple mass spectrometer in food testing laboratories from government and private sector during last three years with contact details.
11.4	Warranty extension	The warranty of equipment would be extended by a month, if equipment has been down for more than 10 days in a year, it would be extended by 1 year, if equipment has been down for more than 30 days due to malfunctioning of the any part supplied by bidder or want of spares.
12	Performance verification and compliance	
12.1	Demonstration and Evaluation	a) We reserves the right to verify the performance of equipment at any stage of purchase process
		a. The bidder are requested to arrange all the pre-requisite and set up applications (as per Sr. no. 1.2a) at their facility for timely, successful demonstration and evaluation.
12.2	Compliance	<p>a. The bidders are requested to provide point wise compliance for each point in specification along with documentary evidences.</p> <p>b. The reference of compliance information in submitted offer shall be clearly specified.</p> <p>c. The offer with incomplete/ untraceable information may not be considered.</p>
12.3	Canvassing	a. Any type of unwarranted canvassing for selection of instrument may lead to rejection of the offer.
12.4	No offering of refurbished / assembled / demo modules	a. No part of the offered instrument shall be refurbished or used in demonstration purpose. Kindly submit undertaking.
		<p>It is the responsibility of vendor to supply a complete solution / unit for the analysis.</p> <p>Vendor should be able to supply all the</p>

13.0	General conditions	spares / consumable required for repair at least 8- 10 years after installation.
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14.0 Reference to Sr. No. 10.0 the list of Pesticides and LOQ to be set up.

Requirement of GC amenable pesticides as per FSSAI in milk and milk products			
Sr. No	Name Of compound	MRL (mg/kg) PPM	Limit of Quantification
1	Aldrin and dieldrin	0.01	1/4 th of Maximum Residue Limit
2	Chlordane	0.01	
3	DDT, DDD & DDE	0.01	
4	Fenithrothion	0.01	
5	Heptachlor	0.01	
6	Lindane	0.01	
7	Chlorpyrifos	0.02	
8	Cypermethrin	0.05	
9	Fenthion	0.01	
10	Fenvalerate	0.01	
11	Phorate	0.05	
12	Pirimiphos-methyl	0.05	
13	Endosulfan (sum of alpha, beta isomers and endosulfan sulfate expresses as endosulfan)	0.01	
14	Heptachlor Epoxide	0.01	
15	Diazinon	0.01	
16	Parathion methyl (sum of parathion-methyl and paraoxon-methyl expressed as parathion methyl)	0.01	
17	Bifenthrin	0.2	
18	Chlorothalonil	0.07	
19	Deltamethrin	0.05	
20	Dichlorvos	0.01	
21	Etofenprox	0.02	
22	Fenproprathrin	0.1	
23	Triaccontanol	0.01	
24	Metiram as CS2	0.05	
25	Mancozeb	0.05	
26	Phosphamidon	0.01	
27	Captafol	0.01	
28	Formothion	0.01	
29	Simazine	0.01	

Requirement of GC amenable pesticides as per EIC-RMP 2019-20 in milk products			
Sr. No	Name Of compound	MRL ($\mu\text{g}/\text{kg}$) PPB	Limit of Quantification
1	Aldrin and dieldrin	6	1/3rd of Maximum Residue limit
2	Chlordane	2	
3	Endosulfan (Sum of Alpha,beta and Sulfate)	50	
4	Lindane	1	
5	Heptachlor (Sum of heptachlor and epoxide)	4	
6	Methoxychlor	10	
7	Diazinon	10	
8	Fenthion	10	
9	Malathion	20	
10	Parathion-methyl	20	
11	Phosalone	10	

Technical Specification of Inductively Coupled Plasma Mass Spectrometer (ICP-MS)

ICP-MS with accessories such as auto-sampler, microwave digestion system, chiller, exhaust fume hood, computer, printer, etc.; is required for the following application:

Application requirement:

A: The equipment should be able to analyze heavy metals in milk, milk products and food samples as per FSSAI and International regulation. Some of the typical limits to be quantified accurately in samples are given below.

Sr No.	Sample	Analyte	Concentration (ppb)
1	Liquid Milk	Lead	10
2	Sugar	Chromium	10
3	Infant food	Arsenic	25
4	Water	Aluminium	15
		Arsenic , lead, selenium	5
		Cadmium	1.5
		Mercury	0.5

Technical specification

The bidders are requested to provide point wise compliance for each point in specification along

with documentary evidences. The reference of compliance information in submitted document

shall be clearly specified. The offer with incomplete/untraceable information may not considered.

Vendor should quote only one model which is latest, fastest in scanning and delivers high throughput without affecting accuracy. End user reserves the right to verify the performance characteristics of the equipment to check the accuracy, precision, speed and ease of operation.

Sr. No.	Technical specification ICP MS with required accessories			
1	Basic configuration of equipment			
A	A complete unit consisting of mass spectrometer with inductively coupled argon plasma to quantify heavy metals at ½ of MRL of FSSAI levels in milk, milk products and food samples is required.			
B	ICP MS should have reaction and collision cell technology to reduce the influence of polyatomic ions and suitable gas ports and gas flow controller should be available. The equipment should have a complete provision to use various gases such as argon, helium, hydrogen, oxygen etc. simultaneously for the analysis of heavy metals in different modes to remove interferences in a single method.			
C	Bidders are required to submit application note or data by using quoted model on the following samples with the offer. I. Recovery of heavy metals in milk or milk products or food samples.			
2	Detector			
	The detector should have linear dynamic range up to 9 order of magnitude or more.			
A	The mass range of the equipment should be 3-260 AMU or wider.			
B	The equipment should meet following guaranteed or typical performance criteria			
C	Sr No	Characteristics	Criteria	Requirements
	I	Sensitivity (mcps/ppm)	Li (7) or Be(9)	≥6
			Y (89) or In (115)	≥100
			Tl (205) or U(238)	≥ 80

	II	Oxide ratio (%)	CeO ⁺ /Ce ⁺	≤ 3
	III	Doubly charged ratio (%)	Ce ⁺⁺ /Ce ⁺ or Ba ⁺⁺ /Ba ⁺	≤ 3
	IV	Background (cps)	Measured at mass 9 or m/z 4.5 or Mass 220	≤ 1
	V	Detection limit (ppt)	Be (9)	≤ 0.5
			In (115)	≤ 0.25
			U (238) or Bi (209)	≤ 0.25
	VI	Isotope ratio precision (%RSD)	Ag (107)/Ag (109)	≤ 0.1
3	Sample Introduction system			
A	Suitable nebulizers, injectors and spray chambers for the analysis of various analytes in milk and food matrix should be supplied along with equipment.			
B	Equipment should have peltier cooling facility to control the temperature.			
C	High precision peristaltic pump with at least 3 channels 10 rollers should be available.			
D	Auto-sampler consisting of suitable sample trays to analyze at least 50 samples at a time should be supplied with complete software package.			
4	Plasma			
A	The equipment should have suitable RF generator. It should have variable power range from 500- 1600 watt.			
B	Suitable quartz torch for food samples should be available.			
5	Interface			
A	Suitable sampler and skimmer nickel cones should be supplied with the equipment to meet different application requirements.			

6	Software of equipment
A	The equipment should be supplied with all required software for instrument optimization, sample analysis, data analysis, auto sampler and data export to excel.
7	Basic consumables, kits and spares
A	All required solutions, kits, spares to optimize and check the performance of equipment should be supplied.
B	Individual standards (1000 ppm -100 ml size) such as arsenic, cadmium, lead, mercury, copper, tin, zinc, chromium, aluminium, selenium bismuth, yttrium, scandium, germanium etc. should be supplied.
8	Re-circulating chiller, gas lines and exhaust system
A	A suitable re-circulating chiller should be supplied.
B	A suitable exhaust system should be included. Bidders are encouraged to visit the site for actual assessment of work.
9	Basic utilities
A	A suitable factory configured computer system with CPU and a monitor minimum 24-inch flat panel with pre-loaded with latest
	Windows operating system, MS Office and other required software should be supplied.
B	Laser jet automatic duplex printer should be provided.
10	Installation and training
A	The pre-installation requirement should be submitted with the offer.
B	The supplier has to perform IQ and OQ of the system at the site.
C	The bidder will provide 5-7 days operational and application training.
D	The bidder has to undertake complete validation for application. It includes sample

	preparation, digestion, extraction, analysis and interpretation of the results.
11	Microwave digestion system:
A	Vendor has to supply a latest model of microwave digestion system capable of digesting minimum 10-12 milk, milk products and food samples together for heavy metal analysis.
B	The volume of TFM/PTFE vessels should be minimum 50 ml. The vessels should be light in weight to keep them on analytical balance for weighing and easyhandling.
C	It should be able to reach temperature up to 250 °C with 40 bar pressure. Installed microwave power should be minimum 850 watt.
D	Filling volume should be 3-25 ml.
E	Equipment should be able to digest sample up to 2 g per vessel.
12	Warranty and Service
A	Minimum 1 year warranty including all parts and 1 year free comprehensive maintenance from the date of installation should be given. AMC for 3-5 years should be quoted.
B	The supplier should have inventory of spare parts and consumables in India.
C	The warranty of equipment would be extended by a month, if equipment has been down for more than 10 days in a year, whereas, warranty of equipment would be extended by 1 year, if equipment has been down for more than 30 days due to malfunctioning of any part supplied by bidder or want of spare.
D	The bidder shall have service facility and trained engineers located in the state /region to provide the breakdown service within 24 – 72 hours of complaintregistration.
E	The supplier shall have application laboratory in India to support the application

	requirement and training needs.
F	Bidder shall provide a list of factory trained service/application engineers/experts of the model quoted and submit a certificate.
G	The bidder should have minimum 15 installation of quoted model in last financial year in India and should provide list of users.

FTIR (Fourier Transform Infrared) Technology Based Milk Analyzer)

1. Application

- a) The equipment should be used for analysis of milk and milk products, adulteration screening and quality determination of raw, intermediate and processed milk.
- b) Products to be analysed: Milk (Raw and processed), Cream, Whey and Yoghurt and Ice cream mixes.

2. Equipment shall be capable of analysing at least below parameters in the range provide:

- a) Fat (Up to 50 % or higher)
- b) Protein (Up to 7 % or higher)
- c) Lactose (Up to 7 % or higher)
- d) Total solids (Up to 55 % or higher)
- e) Solids not Fat (To meet the product requirement as per Sr. No.1)

The above are the minimum performance criteria of equipment. However, measurement ranges should fulfil the compositional criteria for the products outlined at Sr. No. 1.

The additional parameters like Total Acidity / Density / FPD / FFA/ Citric Acids / Casein / Urea /

Glucose / Galactose / True protein /NPN / pH etc. which could be analysed by the equipment

should be indicated by the bidder along with the range of analysis.

- 3. The equipment should be supplied with all required calibrations and software for the products at Sr. No.1. It shall have the provision to upgrade / modify from time to time, if needed.**

4. Equipment should be provided with a standard pre-calibrated module and required software for screening of adulterants like

- a) Ammonium Sulphate
- b) Detergent
- c) Glucose
- d) Maltose
- e) Melamine
- f) Salt
- g) Sodium Carbonate
- h) Sodium citrate
- i) Sorbitol
- j) Starch
- k) Sucrose
- l) Urea
- m) Vegetable Oils when mixed with Chemical Emulsifiers
- n) Formaldehyde

5. In other products, equipment shall be able to analyze the following parameters:

- a) Milk: Fat, Protein, Total Solids, Lactose, SNF

- b) Yoghurt: Fat, Protein, Total Solids
 - c) Whey: Fat, Protein, Total Solids, Lactose
 - d) Cream: Fat, Protein, Total Solids, SNF
 - e) Ice cream: Fat, Protein, Total Solids, SNF
6. Method Set Up: It would be a responsibility of the bidder to set up all the methods in different products and standardize the instrument for work after proper verification.
 7. The equipment should be based on FTIR technology and should follow IDF (International Dairy Federation) standard 141 / ISO 9622 I AOAC Official Method 972.16.
 8. The equipment should be supplied with a networking software along with all necessary accessories to transfer data to client server.
 9. The equipment software should have the quality control features for monitoring instrument stability and status.
 10. The equipment should comply with international safety guidelines. Certificate of these shall be submitted.
 - 11. Technical requirements: -**
 - a) Accuracy: < 1% CV on major milk components for different varieties of milk
 - b) Repeatability: < 0.25% CV on major milk components
 - c) Analysis time: Maximum 40 seconds per sample for milk
 - d) Sample Volume: Less than or equal to 10 ml
 - e) Sample Temp: Approx. 5 - 42° C or wider on both sides
 - f) Cleaning Should be Automatic and Programmable
 - g) Optical System: Should be adequately sealed and protected
 12. Vendor should provide branded PC and suitable printer for equipment operation for sufficient data storage, speed and ease of operation, sufficient ports for transferring online data and support data transmission should be available.
 - 1 GHz CPU speed
 - 8 GB RAM
 - 64 GB free disk space
 - NTFS File system
 - 4xUSB connector
 - 1 GB Ethernet
 - DVD R/W Drive
 - Windows 7, or higher suitable for software of milk analyzer, either 32 Bit or 64Bit versions
 - 13. Consumable and Accessories:** Equipment should be supplied along with appropriate reagents, consumables, spares and accessories for routine operations for approximate analysis of 20000samples during the warranty period.

The requirement of these supplies for samples would be given to bidder on six monthly basis or on mutually agreeable dates.

14. Training: Basic training on operation/maintenance to be arranged by the bidder after installation of the equipment along with calibration development to be done for parallel/alternate milk products. The advance training on these should be conducted as per the request from end user, on mutually agreeable dates. The equipment should also be supplied with user manuals required for installation and training.

15. Warranty: Equipment shall be supplied with minimum a warranty of one year from the date of installation. Bidder should undertake on site minimum two preventive maintenance visits during the warranty period apart from the breakdown visits. Warranty would apply to all the accessories supplied by bidder.

Bidder shall provide one year free comprehensive maintenance for the equipment.

Bidder shall provide service within 48 hrs after registering the complaint during warranty and AMC period.

Warranty extension: The warranty of equipment would be extended by a month, if equipment has been down for more than 10 days in a year, whereas, warranty of equipment would be extended by 1 year, if equipment has been down for more than 30 days due to malfunctioning of any part supplied by bidder or want of spare
Demonstration and Evaluation: Purchaser reserves the right to verify the performance of equipment at any stage of purchase process. The bidder is requested to arrange all the pre-requisite timely for successful demonstration and evaluation if demanded by OMFED.

16. Compliance: The reference / traceability of compliance information in the offer shall be clearly specified with supporting documentary evidences. The offer with incomplete/untraceable information may not be considered. Any type of unwarranted canvassing for selection of instrument may lead to rejection of the offer.

17. No offering of refurbished/assembled/demo modules: No part of the offered equipment shall be refurbished or used in demonstration purpose undertaking must be submitted.

18. The AMC charges shall be quoted separately after the expiry of warranty period (1 Year) and free maintenance for one year.

19. It is the responsibility of vendor to supply a complete solution / unit for the analysis.

20. Vendor should be able to supply all the spares / consumable required for repair for at least 8- 10 years after installation.

21. The vendor should have few installations in major dairies/laboratories of the country and has demonstrated satisfactory performance of the equipment to the concerned stakeholders

Bacteria and Somatic Cell Analyser

1. The instrument should provide Integrated and Automatic Individual Bacteria Count (IBC) and Somatic Cell Count (SCC) in raw milk of cow and buffalo by using Flow-Cytometry as per the approved method of by IDF and ISO.
2. The sample processing module comprising of preparation, incubation, sonication, reagent addition can be located internally in the instrument or external to the analyser.
3. After placing the sample for analysis, all the above operations (at Sr. No. 2) shall be done automatically, without any manual intervention
4. Instrument should be capable of analyzing raw milk samples without dilution or pre-heating.
5. Speed of Analysis:
 - a) Should be able to process minimum 14 samples/hour while doing both IBC and SCC measurements.
 - b) Should be able to process minimum 39 samples/hour for only SCC measurements.
 - c) Should be able to process minimum 14 samples/hour for only IBC measurements.
6. Sample intake should be: less than 20 ml
7. Sample temperature should be in the range of : 2 – 42°C
8. The instrument should be able to estimate IBC and SCC in a wide measuring range
 - IBC: 5000 to 10 million IBC/ml or better
 - SCC: 0 to 10 million cells/ml or better
9. The instrument should provide an accuracy in comparison to standard methods of analysis on the below criteria:
 - IBC: Typical Sy, $x \leq 0.3$ log units from SPC / standard methods
 - SCC: $\leq 10\%$ relative mean different from Direct Microscopic SCC/ standard methods
10. Repeatability:

IBC: $Sr \leq 0.07$ Log relative at 10 to 50 IBC / μ l
 $Sr \leq 0.05$ Log relative at 51 to 200 IBC / μ l

SCC: $CV \leq 6\%$ at 100000 cells / ml
 $CV \leq 4\%$ at 300000 cells / ml
 $CV \leq 3\%$ at 500000 cells / ml
11. The instrument should be supplied with Control Samples and appropriate reagents for analysis.
12. The instrument should have self-cleaning program to minimize carry-over contamination from previous samples.
13. The instrument should have appropriate software for IBC and SCC calculation.

14. Analyser shall be capable of calculating bacteria and somatic cell counts by a single or two (intakes / injections) of sample, preferably with a provision of integrated results of particular sample.

15. IBC and SCC should be performed simultaneously or individually.

System should be provided with Sensors in reagent bag to indicate the consumption of reagent and inform the remaining number of tests that can be performed.

14. Both, bacteria and somatic cell counts should be performed by doing individual cell counts and results should be given in IBC (Individual Bacterial Counts) and SCC (Somatic Cell Counts)

15. IBC and SCC should be performed simultaneously or individually.

16. The instrument should be User friendly, preferably with a provision for indicator for reagent replacement, sample coding, export of results to spreadsheet etc.

17. The instrument should be supplied with software, suitable branded PC with original operating system and suitable laser printer. There shall be a facility to transfer data from the equipment to PC in a suitable format, which could be transmitted to customer software.

18. Supplier should provide Installation, validation, and also the demonstration of the equipment performance

Consumable and Accessories: Equipment should be supplied along with appropriate reagents & consumables for approx. 10000 samples for each IBC and SCC. The requirement of these supplies for samples would be given to bidder on six monthly basis or on mutually agreeable dates or as per tender norms.

Instrument should be supplied with spares and preventive maintenance kits and accessories for routine operations of 2 years.

19. **Training:** Basic training on operation/maintenance to be arranged by the bidder after installation. The advance training on these should be conducted as per the request from end user, on mutually agreeable dates. The equipment should also be supplied with user manuals required for installation and training.

20. **Warranty:** Equipment shall be supplied with minimum a warranty of one year and one year free comprehensive maintenance from the date of installation. Bidder should undertake on site preventive maintenance visits - minimum 2 visits during the warranty/maintenance period apart from the breakdown visits. Warranty/maintenance would apply to all the accessories supplied by bidder.

21. **Warranty extension:** The warranty of equipment would be extended if equipment remains down during the warranty period, for more than period mentioned below: -

- If equipment has been down for more than 10 days in a year, warranty would be extended by one Month,

- If equipment has been down for more than 30 days due to malfunctioning of the any part supplied by bidder or want of spares/ consumable, warranty would be extended by one Year

22. **Demonstration and Evaluation**

Customer reserves the right to verify the performance of equipment at any stage of purchase process. The bidder is requested to arrange all the entire pre- requisite timely for successful demonstration and evaluation.

23. **Compliance:** The bidders are requested to provide point wise compliance for each point in specification along with documentary evidences. The reference of compliance information in submitted offer shall be clearly specified. The offer with incomplete/untraceable information may not be considered.

Any type of unwarranted canvassing for selection of instrument may lead to rejection of the offer.

24. **No offering of refurbished/assembled/demo modules.** No part of the offered instrument shall be refurbished or used in demonstration purpose for which undertaking must be submitted.

25. **Maintenance & service** for one year shall be free after the expiry of warranty period and thereafter AMC charges from 3rd year onwards should be quoted separately.

26. It is the responsibility of vendor to supply a complete solution / unit for the analysis.

27. Vendor should be able to supply all the spares / consumable required for repair at least 8-10 years after installation.

28. The vendor should have few installations in major dairies/laboratories of the country and has demonstrated satisfactory performance of the equipment to the concerned stakeholders.

Electronic milk Analyser with adulteration testing facility

1. Product to be analysed: Raw milk
2. Raw Milk Quality and Adulteration Screening Analyser should be based on the FTIR / MIR / or other suitable techniques, individually or in combination (hybrid).
3. Equipment should be able to give a measurement of Fat, SNF and Protein.
4. The equipment should be supplied with all required calibrations with provision to upgrade / modify from time to time, if needed.
5. Equipment should be able to detect at least below mentioned adulterants:
 - a) Urea - LOD of 0.2 % or lower
 - b) Ammonium sulphate - LOD of 0.1% or lower
 - c) Maltodextrin - LOD of 0.6 % or lower
 - d) Sucrose - LOD of 0.6 % or lower
 - e) Water - LOD of 20 % or lower
 - f) Equipment should compare the spectrum of the sample with the spectrum of pure milk by using suitable statistical techniques and software to detect abnormality.

Additional adulterants, if any analysed using the equipment shall be specified by the bidder.

6. Equipment should be able to analyse Fat, SNF & Protein in the range of
 - a) Fat: 0.5-12 %
 - b) Protein: 2-6 %
 - c) SNF: 6-12‰

The above ranges are the minimum required criteria; equipment with wider working range on both sides would be acceptable.

7. Accuracy of milk parameters for compositional analysis should be minimum as below:
 - a) Fat \leq 0.1 (Either in terms of SD or in absolute amount)
 - b) Protein \leq 0.2 (Either in terms of SD or in absolute amount)
 - c) SNF \leq 0.2 (Either in terms of SD or in absolute amount)

8. Repeatability of compositional parameters shall meet the relevant international standards (ISO/IDF/AOAC or others) and document for the same need to be submitted.
9. Analysis speed required - Approx. 40-50 seconds
10. Sample Temperature: Raw Milk should be able to be measured in a temp range of 5-35 deg. C or wider.
11. Sample Volume: Less than 10 ml.
12. Display: LCD, graphical display / Colour TFT display.
13. Built-in Diagnostics: Equipment shall be able to perform all the required test to ensure accurate and error free operations.
14. System shall have the capability to transfer data by any suitable means from equipment through RS-232 or SD Card or Wi-Fi or facility of PC based software.
15. **Consumable and Accessories:** Equipment should be supplied along with appropriate reagents, consumables, spares and accessories for routine operations for approximate analysis of 10000 samples during the warranty period.

The requirement of these supplies for samples would be given to bidder on six monthly basis or on mutually agreeable dates.

16. Training: Basic training on operation/maintenance to be arranged by the bidder after installation of the equipment along with calibration development. The equipment should also be supplied with user manuals required for installation and training.

17. Warranty: Equipment shall be supplied with minimum warranty of one year from the date of installation. Bidder should undertake on site minimum two preventive maintenance visits during the warranty period apart from the breakdown visits. Warranty would apply to all the accessories supplied by bidder.

AMC - 1 year free comprehensive maintenance be provided and AMC charges from 3rd year onwards should be quoted separately.

Warranty extension: The warranty of equipment would be extended by a month, if equipment has been down for more than 10 days in a year, whereas, warranty of equipment would be extended by 1 year, if equipment has been down for more than 30 days due to malfunctioning of any part supplied by bidder during warranty period.

18. Demonstration and Evaluation

Purchaser reserves the right to verify the performance of equipment at any stage of purchase process. The bidder are requested to arrange all the pre-requisite timely for successful demonstration and evaluation as per tender / bidder specification.

19. Compliance

The reference / traceability of compliance information in the offer shall be clearly specified with supporting documentary evidences. The offer with incomplete/untraceable

information may not be considered. Any type of unwarranted canvassing for selection of instrument may lead to rejection of the offer.

20. No offering of refurbished/assembled/demo modules: No part of the offered equipment shall be refurbished or used in demonstration purpose. Kindly submit undertaking.

21. The AMC charges for two years after the expiry of warranty period shall be quoted separately.

22. It is the responsibility of vendor to supply a complete solution / unit for the analysis.

23. Vendor should be able to supply all the spares / consumable required for repair for at least 8- 10 years after installation.

24. The vendor should have few installations in major dairies/laboratories of the country and has demonstrated satisfactory performance of the equipment to the concerned stakeholders.

Automatic Kjeldahl Unit

1. Quantity

Number of unit's required-01 with all the required accessories

2. Functional Requirement

Estimation of protein content in milk and milk products. The offered equipment shall have digestion and distillation unit with automatic addition of reagents for efficient operation. Titration would be undertaken manually.

3. Technical Specification

3.1 Digestion Unit

- i. Six place block digestion system able to hold 250 ml borosilicate glass tubes.
- ii. Operational temperature: Ambient to 4500 C or higher.
- iii. Display should show set value and current value of temperature and timer.
- iv. It must have auto heating cut off on completion of digestion cycle.
- v. Efficient exhaust manifold system for removing acid fumes.
- vi. Material of construction: Corrosion resistant

3.2 Scrubber unit

- i. Unit should have fume trap condensation unit followed by water and alkali neutralization.
- ii. Alkali and water container capacity: 2 lit (Minimum)
- iii. Operation pump must be made up of non-corrosive material.
- iv. Unit shall have a mechanism to remove acid from exhaust air through dissolution in water tank / carbon filter / any other suitable technique.

3.3 Distillation unit

- i. Unit shall have automatic steam injection.
 - ii. Unit shall have automatic water addition / dilution.
 - iii. Unit shall have automatic alkali and boric acid / acid addition.
 - iv. Unit shall give warning / indication for open door during operation and hold / deactivate the process.
 - v. Unit shall have facility for adjustable steam power.
 - vi. Material of construction: Corrosion resistant.
 - vii. Chemical storage tanks shall be provided with minimum 2.5 lit capacity
 - viii. Auto cut off sensor for water circulation shall be provided.
- 4.** Equipment shall be supplied with minimum 1 year warranty & one year free comprehensive maintenance.
- 5.** Unit shall be supplied with 12 borosilicate tubes (250 ml), required accessories, water connection pipes required for installation, demonstration and routine operations for at least 300 analyses.

6. Demonstration:

- i. Vendor must optimize digestion and distillation method for liquid milk and dried milk samples.
- ii. Vendor must provide training to end user.
- iii. Vendor must provide demonstration to end user including manual titration and verify the distillation recovery of >99%.

7. Others:

- i. All the pre-requisite required for installation of the equipment shall be indicated by the vendor.
- ii. AMC charges for the 3rd and 4th year shall be indicated separately.
- iii. It is the responsibility of vendor to supply a complete solution / unit for the analysis.
- iv. Vendor should be able to supply all the spares / consumable required for repair at least 8-10 years after installation.

Laminar Air Flow Unit

- 1) UV sterilization system with high density UV-decontamination (Min 975 Lux and lamp min 250 nanometer 10-15-watt).
- 2) Laminar airflow velocity of minimum 0.30 m/s (60 fpm.)
- 3) Low noise level (<58 dBA) with low power consumption.
- 4) HEPA filter efficiency 99.999% /at 0.3 um along with Pre-Filter.
- 5) **LED display** (microprocessor control) with digital timer, light on-off...etc.
- 6) Alarm for filter replacement and maintenance if any.
- 7) **Interlock function**: UV lamp only can be switched on when the front window is closed ensuring operator safety.
- 8) **UV light protection** (Front & Side windows: Toughened glass, Manual front window, and anti-UV).
- 9) **UV timer** (1-99 minutes): when the set time expires, the UV lamp automatically switches off in preparation for the next experiment.
- 10) Waterproof power socket for power supply (min two sockets).
- 11) **Material**: main body: electro galvanized steel with epoxy-polyester powder coating (antimicrobial coating) and work table: 1.2 mm (0.05") 18 gauze stainless steel grade 304 (minimum).
- 12) **Size**: External Size (W*D*H)- 1035 x 617 x 950 mm, Internal Size (W*D*H)- 935 x 538 x 550 mm and Work Surface Height-750mm
- 13) **Plug type**- Indian
- 14) Essential standard accessories along with the equipment
 - 15) Revolving base table with Adjustable height. Adjustable height range 660-940 mm (26.0"-37.0"), adjustable in 25.4 mm (1.0") increments.
- 16) Instrument should comply with worldwide standard in the regards of Air Quality, Filtration and Electrical Safety.
- 17) Calibrated in laboratory as per ISO-17025.
- 18) Commissioning and installation will be done by the party.
- 19) It is the responsibility of vendor to supply a complete solution fit for use.
- 20) Vendor should be able to supply all the spares / consumable required for repair at least 8-10 years after installation.

Technical Specification - 9**Specification of Sodium Potassium Analyser**

Name of Equipment	Flame Photometer	
Application	Measurement of Sodium and Potassium content in milk	
Equipment Specification		
SI No	Parameter	Description
1	Unit of Measurement	System shall display results directly in ppm.
2	Range of Measurement	should measure Na, K in the range of : 2 -200 ppm or better on both sides.
3	Sensitivity	Na: 2 ppm ; K: 1 ppm
4	Linearity	3% or lower
5	Reproducibility	Less than 2 % Coefficient of Variation
6	Calibration	Minimum 5 point calibration facility should be present in the instrument. Relevant set of chemicals for calibration standards of Na (min. 100 ml of 100 ppm) and K (min. 100 ml of 100 ppm) should be provided by bidder.
7	Detector	Silicon Photodiode or equivalent or better detection system
8	Auto flame ON/ OFF detection	Facility should be present in the system
9	Ignition System	Automatic Ignition
10	Flame System	LPG/PNG & Dry Oil Free Air
11	Gas Control	Provision for Gas Control should be available
12	Filter Selection	Provision for Filter Selection should be available
13	Atomiser	Axial Flow Type
14	Display	Alphanumeric LCD Display or digital LED display
15	Power Supply	Standard Indian – Single phase
16	Air supply unit	The instrument should be supplied with air compressor unit to supply required gases.

17	Data storage and Printing	System shall be able to store data of at least 500 analysis
		RS 232 port for data transfer. All cables/ software for data transfer to be offered along with a suitable printer
18	Accessories to be provided	<p>Following accessories should be provided with the instrument:</p> <p>Two filters (Na and K) , calibration standards (as indicated at Sr. No. 6) , Atomizer Tube, Gas Lighter, Sample Beaker (Min.6 No), USB interface cable, LPG Tube, Air line PU Tube, power cord etc.</p> <p>All the other accessories required for smooth installation, demonstration and operation of the equipment for above application should be provided.</p>
19	Other	At the time of installation, the performance of the equipment should be demonstrated as per the provided specifications or OEM catalogue whichever is better.
		The accessories required for commissioning of the equipment shall be in the scope of supplier.
20	Training	Training to end user to be provided
21	Demonstration & Method Set up	Bidder has to standardize and optimize the Equipment for analysis of Sodium and Potassium at the installation site.

SPECIFICATION OF GERBER CENTRIFUGE

- 1. Electrically Operated (220 – 240 Volt)**
- 2. Capacity :- 8 to 12 Milk Butyrometers with Rotors**
- 3. Digital Timer & Tachometer**
- 4. Digital Temperature Controller**
- 5. Microprocessor (preferable)**
- 6. Speed:- 1400 rpm minimum**
- 7. Auto Brake (preferable)**
- 8. Cover Lock.**

**SPECIFICATION OF
ANALYTICAL WEIGHING BALANCES 220 G (0.001)**

1. Electronic Analytical Weighing Balance
2. Capacity – 220 gm.
3. Accuracy – 0.1 mg
4. Least Count – 0.1mg
5. Digital Display (LCD)
6. Power supply – 220 to 240 Volt
7. Battery Backup
8. Pan size – 80 mm