SUPPLIER ◂ -- ▸ FRIENDLY ◂ -- ▸ CUSTOMER

DAIRY BUSINESS MANAGEMENT SYSTEMS

QUALITY SYSTEM DOCUMENTATION
(ISO – 9001: 2000)

MODULE-IV

QUALITY ASSURANCE MANUAL

INNOVATIVE BUSINESS IMPROVEMENTS (P) LTD.
Regd. Office #53-A, Sector 18-A CHANDIGARH-160018
Tel:0172-2724872 Cell: 9815961853 email:ibiu@hotmail.com

"WHITE REVOLUTION THROUGH QUIET EVOLUTION"

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.		Page No. 1
TITLE : **DEPARTMENTAL PROCEDURES QUALITY ASSURANCE**		Date : - 01.04.04
SR NO.	TABLE OF CONTENTS	PAGE NO FROM - TO
A	**PART – I**	
1.	TABLE OF CONTENTS	01 TO 01
2.	LIST OF REVISIONS	02 TO 02
3.	SCOPE	03 TO 03
4.	OBJECTIVES	04 TO 04
5.	DEPARTMENTAL STRUCTURE	05 TO 05
6.	DUTIES & RESPONSIBILITIES	06 TO 14
7.	PROCEDURES	15 TO 25 A1-01 TO A1-28 B1-01 TO B1-53
B	**PART - II**	C1-01 TO C1-28 D1-01 TO D1-29 E1-01 TO E1-37
C	**PART – III**	F1-01 TO F1-10
8.	CONTROL OF QUALITY RECORDS	01 TO 01
9.	ANNEXURERS	01 TO 32
10.	ANNEXURER (**U**)	01 TO 06
11.	FORMATS	01 TO 32

Prepared by **H O D**	Approved by **CEO**
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMMRP – 02]

2. LIST OF REVISIONS

SR. NO.	DCN NO.	Nature of Change	Affected Clause	Page No	Revision No.

Prepared by **H O D**	Approved by **CEO**
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

3. SCOPE

The procedure of Quality Assurance department covers activities pertaining to monitoring and controlling the specified quality standards of dairy products at all stages from milk procurement to dispatches of finished products.

To conduct testing of all incoming chemicals, testing materials and raw materials required for milk products and packaging materials for finished products.

4. OBJECTIVES

4.1 Accurate and expeditious testing of incoming raw milk, raw materials Chemicals and packaging materials.

4.2 Carry out in process tests for milk and milk products at prescribed frequency.

4.3 Analysis of finished products for ascertaining that these conform to Agricultural Grading and Marketing (AGMARK) / Prevention Of Food Adulteration Act (PFA) / Bureau of Indian Standard (BIS) / INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD. specifications.

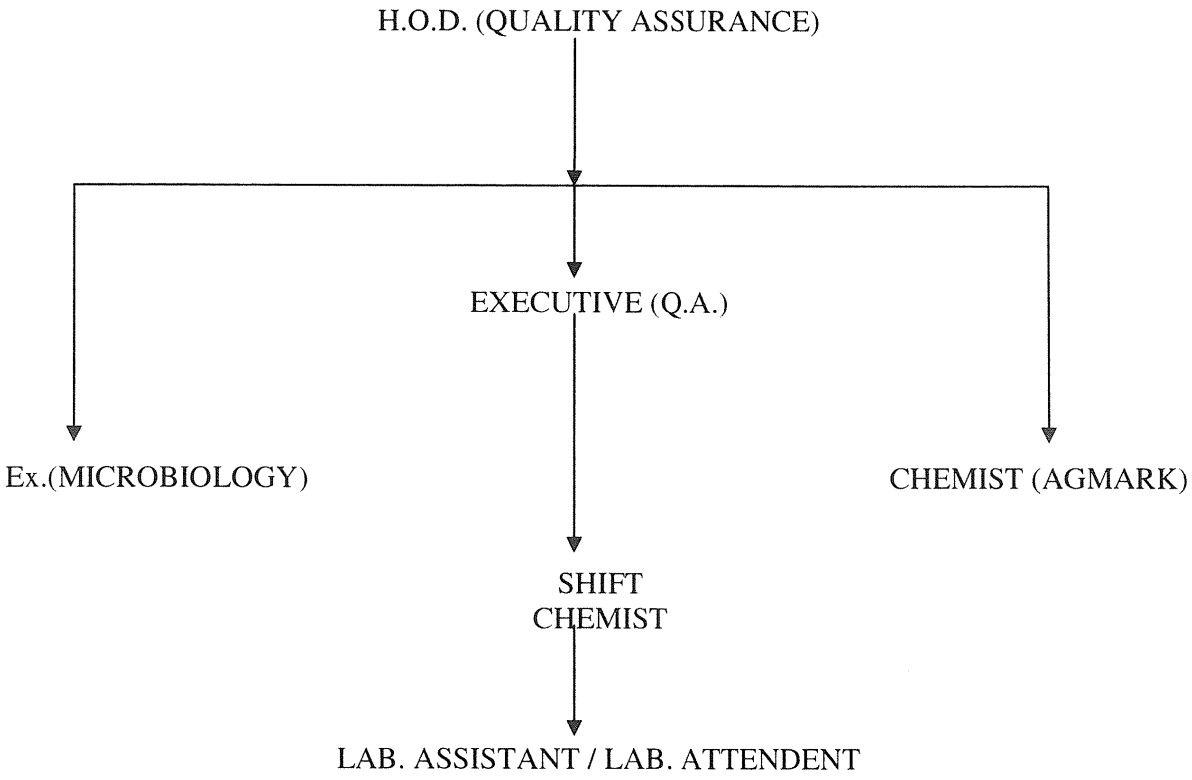
4.4 Bacteriological tests of milk and milk products as per specified procedures and parameters.

4.5 Line testing of milk products as per prescribed frequency to identify the source of contamination.

4.6 Bacteriological tests for plant sterility at regular prescribed frequency.

4.7 Continual improvement in the quality of milk and milk products.

5. DEPARTMENTAL STRUCTURE



6.1 DUTIES AND RESPONSIBILITIES OF H.O.D. (QUALITY ASSURANCE)

6.1.1 Responsible for the overall functioning of Quality Assurance department of the Plant.

6.1.2 To co-ordinate with technical officers working in Q.A for achieving the targets fixed by the Management.

6.1.3 To ensure that the milk and milk products manufactured in plant are of the highest quality standards conforming to legal / IBI standards.

6.1.4 To co-ordinate with other departments in the company for all functions related to optimizing performance of Production and Quality Assurance department.

6.1.5 Responsible for planning the requirement of glaswares, chemicals and consumables for timely purchase including the maintenance of proper inventory of all such items for efficient and smooth operation of the Quality Assurance department.

6.1.6 Responsible for preparing and monitoring cleaning and sanitation schedules for maintaining the best hygienic conditions in the Plant.

6.1.7 To co-ordinate all Research and Development activities assigned by the Management from time to time.

6.1.8 To maintain record for the complaints received from market and corrective actions to be taken in this regards (QMQ-22).

6.1.9 To maintain record for the rejected finished products and their disposal (QMQ-32).

6.1.10 Ensure timely renewal of all licenses namely ISI, AGMARK, FPO & export license.

6.1.11 To maintain liaison with all government departments pertaining to QA department.

6.1.12 To ensure that only milk & milk products conforming to weights & measures act and meeting all statutory requirements are allowed to leave the factory.

6.1.13 To ensure that only calibrated equipment & glassware are used for testing of milk & milk products and all tests are performed accurately.

6.1.14 Ensure optimum utilization of men, materials & machinery.

6.1.15 Any other duty assigned by the management from time to time.

6.2 DUTIES AND RESPONSIBLITIES OF EXECUTIVE (Q.A.)

6.2.1 To ensure standardization of chemicals used in laboratory.

6.2.2 To carry out random checks of milk and milk products for accuracy of weights and statutory requirements. (MRP, BATCH NO., DATE OF PROD. ETC.)

6.2.3 To carry out regular check on personal hygiene of employees working in the plant.

6.2.4 To carry out R & D activities assigned by the Management from time to time.

6.2.5 To impart technical training to chemists / Lab. Assistant / Lab. Attendant as and when required.

6.2.6 To conduct random re-testing of samples of incoming raw milk for adulterants and allied tests.

6.2.7 To carry out random of Liquid Milk for Fat / SNF and other parameters on weekly basis.

6.2.8 To conduct random check of total Protein contents, casein Protein of incoming raw milk and SMP by kjeldhal method.

6.2.9 To conduct re-testing of SMP / WMP / Dairy whitener for all parameters.

6.2.10 To issue Quality certificate for finished products to Production Section & store.

6.2.11 Ensure that Laboratory is neat and clean all the times.

6.2.12 To ensure proper maintenance of records of Laboratory.

6.2.13 To conduct gravimetric analysis of liquid milk once in a week.

6.2.14 To carry out periodic check for calibration of testing equipment & glassware used for laboratory.

6.3 DUTIES AND RESPONSIBILITIES OF EXECUTIVE (MICROBIOLOGIST)

6.3.1 To carry out Bacteriological testing of milk and milk products as per specified procedures and frequency to meet PFA/BIS/IBI standards.

6.3.2 To conduct line testing of milk and milk products at various stages as per specified frequency.

6.3.3 To conduct sterility test for pipelines, storage tanks, milk tankers etc, as per specified procedures and frequency.

6.3.4 To conduct random visual inspection of plant premises & equipment during cleaning and sterilization.

6.3.5 To keep regular check on the personal hygiene of the employees working in the plant with regard to their health, clean hands, wearing of proper clean uniform, caps & masks to avoid contamination.

6.3.6 To carry out proper propagation of culture & maintaining its record.

6.3.7 To keep proper record of bacteriological work carried out on daily basis.

6.3.8 To conduct bacteriological testing of raw water as per specified frequency and procedure.

6.3.9 To conduct bacteriological testing of aerial flora of different sections as per specified frequency.

6.3.10 To conduct shelf life study of sterilized milk.

6.3.11 Ensure accurate and timely testing of packaging materials as per specified procedures.

6.3.12 To conduct bacteriological tests for raw milk received from milk chilling centers as per specified frequency.

6.3.13 Any other job assigned by the management from time to time.

6.4 DUTIES AND RESPONSIBILITIES OF SHIFT CHEMIST

6.4.1 To conduct accurate testing of specified tests for incoming raw milk from various sources as per specified procedures.

6.4.2 Ensure proper segregation of milk on grade basis as per requirement of manufacturing process for different types of products & to maintain relevant record.

6.4.3 To supervise and carry out counter checking of jobs assigned to laboratory Assistant working in processing Laboratory & main Laboratory.

6.4.4 Ensure that only calibrated equipment and glass wares are used for testing of milk and milk products.

6.4.5 Ensure efficient use of men, materials and equipment.

6.4.6 Ensure proper maintenance of records and compliance of statutory provisions with regard to PFA, BIS & AGMARK.

6.4.7 To coordinate with production officers and ensure that proper cleaning schedules are strictly followed.

6.4.8 To carry out random checking of milk and milk products for accuracy of weights and statutory requirements.

6.4.9 Ensure that all hygienic precautions are observed during handling of milk products.

6.4.10 To monitor the quality of milk in all storage tanks at specified frequency.

6.4.11 To monitor the temperature of various cold stores as per specified frequency namely liquid milk, table butter cold store & ghee granulation storage etc.

6.4.12 To monitor the strength of alkali & chlorine solution at the end of the shift.

6.4.13 To conduct the testing of milk products as per specified procedures and frequency.

6.4.14 Ensure cleanliness and house keeping of Laboratory.

6.4.15 To issue quality certificate for liquid milk at the time of dispatches.

6.4.16 To monitor cleanliness of milk tankers and cans before issuing gate pass for milk tankers.

6.4.17 To ensure that quality of skimmed milk & liquid milk is properly checked from silos and Liquid Milk tanks before releasing for Skimmed Milk Powder production / filling.

6.4.18 To ensure that quality of ghee is checked for all specified parameters before starting of filling and issue quality certificate.

6.4.19 To check cleanliness of storage tanks.

6.4.20 To impart practical training to Lab. Assistant / Attendants.

6.4.21 To conduct shelf life studies of liquid milk at room temperature.

6.4.22 To conduct random tests for SMP / WMP / Dairy Whitener manufactured during the shift.

6.4.23 To issue quality certificate for all categories of pasteurized milk before filling of liquid milk.

6.4.24 To check the quality of silo's milk as per specified parameters before feeding to powder plant.

6.4.25 To conduct organoleptic tests for milk products daily.

6.4.26 Any other duty assigned by the management from time to time.

6.5 DUTIES AND RESPONSIBILITIES OF AGMARK CHEMIST

6.5.1 To maintain all ledgers pertaining to ghee grading.

6.5.2 To reconcile accounts of ghee grading with Audit Section / Accounts section on monthly and yearly basis.

6.5.3 To carry out all tests for pure ghee specified under Agmark standards such as color, flavor, aroma, moisture, FFA, RM value, PV and BR reading for each melt of ghee.

6.5.4 To send ghee samples analysis report to AGMARK office as per frequency laid down by AGMARK authorities.

6.5.5 To send ghee grading report to Agmark Chandigarh office before 10^{th} of every month.

6.5.6 To check cleanliness of ghee section every day & ensure that melt No., MRP & Agmark Sr.Nos are a fixed on each container specified under ghee grading norms.

6.5.7 Ensure that ghee is packed under hygienic conditions and all precautions regarding cleaning of empty tins and filled tins are being taken as per IBI procedures.

6.5.8 To check weight of packed ghee containers melt wise (Minimum twice in a day) and maintain relevant record.

6.5.9 To issue quality certificate to Production & Store department for release of ghee after checking ghee tins for cleanliness and granulation.

6.5.10 To check sediment of ghee for each ghee filling tank before starting filling of Ghee.

6.6 DUTIES AND RESPONSIBILITIES OF LAB. ASSTT. (POWDER PLANT)

6.6.1 To carry out specified tests at prescribed frequency for SMP, WMP & Dairy Whitener.

6.6.2 To check moisture contents of dry powder by gravimetic method after every two hours.

6.6.3 To conduct all prescribed tests for dry powder (silo wise) such as acidity, I. Index, Ash % and sediment.

6.6.4 To conduct random check for weight of filled K.P. bags after every thirty minutes and maintain proper record.

6.6.5 To check the quality of dry powder being packed in small packaging i.e. 1 kg, 500 gms. & 200 gms and also conduct random check for weight in small packaging after one hour & maintain relevant record.

6.6.6 To check personal hygiene of workers working in sifter room & packaging room (Trimming of nails, short hair, wearing of caps & masks).

6.6.7 To check statutory requirements for dry powder being packed in small packaging.

6.6.8 To draw samples for microbiology purposes for SMP / WMP / Dairy Whitener as per specified frequency.

(blended / non-blended)

a) SMP → After 100 Bags.
b) WMP → After 50 Bags.
c) Dairy Whitner → After 100 Bags.

6.6.9 Any other duty assigned by the management from time to time.

6.7 DUTIES AND RESPONSIBILITES OF LAB. ASSISTANT (PROCESSING SECTION)

6.7.1 To check the quality of milk in storage tanks at specified intervals. (At the start of the shift & also at the end of the shift.)

6.7.2 To carry out FAT for Skimmed milk at an interval of ten minutes.

6.7.3 To carry out FAT % of cream at the interval of 1 hour.

6.7.4 To standardize the milk during various operations for indigenous products, Ice cream, liquid milk, milk for whole milk powder etc.

6.7.5 To check and record the process parameters and temperature during processing operations.

6.7.6 To check the temperature of liquid milk cold store, Ice cream cold store & ghee granulation room at specified intervals.

6.7.7 To check the weight of liquid milk pouches from cold store after one hour.

6.7.8 To check the FAT / SNF of milk of first pouch of each machine before starting filling.

6.7.9 To conduct Methylene blue reduction test (MBRT) of storage tanks and liquid milk pouches as per specified procedure & prescribed frequency.

6.7.10 To conduct quality of milk during filling of flavored milk and exercise check on quality of milk in bottles, cleanliness of bottles before and after filling, corking, labeling and statutory requirement.

6.7.11 Check temperature of milk at the time of dispatches and keep three pouches of every variety for shelf life studies.

6.7.12 Check sediments for liquid milk in P. tank and storage tank before releasing milk for filling.

6.7.13 Check quality of buttermilk of each lot.

6.7.14 Check alkalinity of CIP solution, strength of chorine solution along with tank position.

6.7.15 To check cleanliness of storage tanks.

6.7.16 To check Fat % of ghee residue water and allow drain off only after it conforms to IBI specifications.

6.8 DUTIES AND RESPONSIBILITIES OF LAB. ATTENDANT

1. To draw samples from raw milk tanker as per specified procedures.
2. To draw samples from milk storage tanks as per specified procedures.
3. To draw samples of packaging materials as per specified procedures.
4. To keep Lab neat & clean in each shift.
5. To clean glassware namely beakers, butyrometers, test tubes & petridishes etc.
6. To assist the shift Chemist in dock Lab for carrying out platform tests for incoming raw milk.

7. PROCEDURES

7.1 RECEPTION OF MILK TANKERS

7.1.1 Allow the milk tanker to stand for 30 minutes. Take milk sample from top layer of milk for B.R. test.

7.1.2 Representative milk sample from Milk Cans or tanker received from MCC / VDC / contractor is drawn in six milk bottles.

7.1.3 Two samples after addition of preservative (1 ml. Potassium dichromate 10 % solution) is kept in a locked box in Weighbridge room for retesting. Remaining four samples are taken to laboratory for complete analysis.

7.1.4 Chemist / Lab Assistant carries out the specified tests as per specified test procedure.

7.1.5 Analysis results are recorded in QMQ – 01.

7.1.6 If milk conforms to IBi specifications, Production department is asked to unload the milk tanker. Quality Clearance Slip QMQ – 17 is issued to Production Department indicating the grade of milk. IBI specifications for raw milk are described in Annexure 'G'.

7.1.7 Milk is unloaded in raw milk tanks as per its grade separately. Record of unloading of raw milk is maintained in QMP – 01.

7.1.8 All glassware used for testing namely butyrometers, pipettes, thermometers & lactometers are checked for their accuracy against standard apparatus.

7.1.9 All these are authenticated for their accuracy by signing on all these apparatus / glassware by HOD (QA) and committee members.

7.2 SEPARATION / STANDARDIZATION OF MILK

7.2.1 Milk in raw milk tanks is separated as per requirement.

7.2.2 Sample for fat (%) in skimmed milk is monitored at regular intervals 15 Mts. and recorded in QMQ – 03.

7.2.3 Skimmed milk is transferred to Skimmed milk silos for further feeding to powder plant.

7.3 TESTING OF MILK IN STORAGE TANK

7.3.1 Quality of milk for various parameters defined under frequency table in Annexure – 'A' for storage tanks i.e. RMT1, RMT2, PT1, PT2, PT3, PT4, S1, S2 & S3 is carried out at regular frequency intervals and recorded in QMQ – 02.

7.3.2 In case of any deviation, production department is informed to take immediate corrective action.

7.4 STANDARDIZATION OF LIQUID MILK

7.4.1 MCC / VLC milk is used for standardization of city supply milk. FAT / SNF is standardized as per category of milk defined in Annexure 'H'.

7.4.2 Various tests are carried out as defined in frequency table in Annexure 'A'.

7.4.3 MBR Time test for city supply milk is carried out at various stages to assess the extent of contamination. Frequency defined in 'Frequency Table' (Annexure – A).

7.4.4 In case MBR Time is below 5.0 hrs., Milk is not allowed to go for city supply. The matter is referred to technical committee.

7.5 STANDARDISATION OF MILK FOR INDIGENOUS PRODUCTS

7.5.1 MCC / VLC milk is used for standardization for indigenous products.

7.5.2 Requisite Fat / SNF is maintained for Lassi, Sweetened Flavored Milk (SFM), Milk Cake, Paneer, which is defined in Annexure 'C'.

7.5.3 Various tests for checking the suitability of milk are defined in Frequency Table in Annexure 'C'.

7.6 TESTING OF INDIGENOUS PRODUCTS

7.6.1 Specified Chemical and Bacteriological tests for various indigenous products namely Lassi, Paneer, Milk Cake, SFM, Pinni, Dahi are carried out as defined in Annexure "C" and recorded in QMQ – 5.

7.6.2 In case, the milk product does not conform to IBI standards, the matter is referred to standing technical committee comprising of GM (W), Mgr.(Prod) & HOD (QA) for final decision.

7.6.3 Line testing for indigenous products is carried out at regular frequency defined in Annexure–'B' to assess the source and level of contamination and recorded in QMQ-19.

7.7 TESTING OF MILK PRODUCTS

Various chemicals & bacteriological tests are carried out for all finished products namely Skimmed Milk Powder, Dairy Whitener, Whole Milk powder, white Butter, Sterilized flavored milk, Table Butter, and ghee as per specified procedures and work instructions at regular intervals at various stages which have been defined in Annexure "A" and recorded in the respective formats.

7.8 LINE TESTING OF MILK PRODUCTS

Line testing of various milk products is carried out at various stages of production as per specified frequency defined in Annexure – B01 to assess the source of contamination if any during process stages and recorded in QMQ-19.

7.9 PLANT STERILITY & AIR ENVIRONMENT

7.9.1 To monitor & control the cleanliness of various plant equipment of Production department, sterility tests are conducted for pipe lines and storage tanks at frequency defined in Annexure NO – B OI and recorded in QMQ-14.

7.9.2 Similarly to monitor & control the aerial flora of factory, aerial flora test is performed at intervals specified in Annexure – B02 for various sections of production and recorded in QMQ-13.

7.10 ACCURACY OF WEIGHTS OF FINISHED PRODUCTS

Random checking by QA staff is conducted in each shift to ensure that packed finished products conform to Weights & Measures Act. In case of any deviation, concerned Production officer is informed to initiate corrective actions. Results are recorded in the QMQ-21.

7.10.1 MRP, Batch No. / Melt No. & Date of manufacture is indicated on each pack so that finished products conform to statutory requirements.

7.11 CONSUMER COMPLAINTS

When ever any complaint regarding quality of milk & milk products is received from consumer through marketing department or directly, following actions are initiated. Compliant received is recorded in the complaint register QMQ-22.

7.11.1 The history of finished products is ascertained by Melt No. / Batch No. / Date of Mfg. indicated on pack.

7.11.2 Matter is investigated to ascertain the reasons for complaints.

7.11.3 Preventive action is initiated so that re-occurrence is prevented.

7.11.4 System is monitored fortnightly for two months to check the effectiveness of the procedure & quality system.

7.11.5 Decision taken by technical committee is recorded in the Complaint Register QMQ-22 and the decision is communicated to marketing department for further communication to complainant.

7.12 DISPOSAL OF NON-CONFORMANCE OF MILK PRODUCTS

7.12.1 If finished products do not conform to PFA / BIS / AGMARK / IBI specifications, then matter is referred to Standing technical committee comprising of GM (W), Mgr.(P) & HOD (QA).

7.12.2 Decision taken by the committee GM (W), HOD (QA) & Mgr.(P) is recorded in the Non Conformance of Products Register QMQ-32 and decision is communicated to concerned department for further necessary action. Committee members also discuss corrective and preventive measures in respect of non-conformance of milk products & record in QMQ-32 register.

7.13 QUALITY STATUS OF MILK & MILK PRODUCTS

After analysis of milk & milk products, quality status is informed to Production & Store departments by Q.A department for further necessary action. Testing results are recorded in QMQ-31.

7.14 TESTING OF INCOMING PACKAGING MATERIAL / CHMICALS / GLASS-WARES / OTHER INPUTS

All incoming packaging materials, chemicals & glassware are checked for various parameters defined in Annexure – 'D & E' to check their suitability as per specified procedure. In case, it does not conform to IBI standards, decision taken by technical committee is recorded and conveyed to concerned department for necessary action. Test results are recorded in QMQ – 10.

7.15 STATISTICAL TECHNIQUE

7.15.1 Statistical Technique for representative sampling for finished products & incoming packaging material is used.

7.15.2 Number of sample drawn for various lots has been defined separately in the individual item testing procedures for each product & packaging material.

7.16 MAINTENANCE OF BACTERIAL CULTURE

7.16.1 Dahi and Lassi cultures are propagated & maintained in the Laboratory.

7.16.2 Activity of culture is checked on daily basis.

7.17 PEST CONTROL / FUMIGATION OF SMP GODOWN

7.17.1 Fly control and Pest control activities are carried out by Quality Assurance Department on daily basis. Procedure for fumigation of SMP Goodman is in Annexure – Q. Procedure for Pest control is summarized in Annexure – S.

7.18 PERSONAL HYGIENE

7.18.1 Personal hygiene of the employees working in different sections is checked and monitored on daily basis as per Annexure – P.

7.19 HANDLING OF REJECTED MILK & MILK PRODUCTS

A) Raw Milk

7.19.1 If raw Milk received does not conform to IBI specifications, it is treated as rejected. The tanker is returned to supplier with reason of rejections in writing by chemist.

7.19.2 Raw milk having a temperature higher than 10 deg C but otherwise normal is accepted and re-chilled to below 6 deg C or pasteurized and utilized quickly.

B) Table butter

7.19.3 Table butter from the churn having 'free – moisture' is re-processed.

7.19.4 Table Butter having high salt content (More than 3 % or with less than 2 %) and more than color desired is blended with good butter upto 25 % or reprocessed as per standing committee members decision.

7.19.5 Table Butter / White Butter having high count of (Yeast, Mould & coliform count) than specified is converted into ghee.

C) Ghee

7.19.6 Ghee with high moisture (i.e. more than 0.3 %) is advised for re-processing.

7.19.7 Ghee with high free Fatty Acids (FFA) over 0.5 % is blended in small amount with normal quality of ghee as per advice of Q.A department.

7.19.8 Ghee with organoleptic defects i.e. off flavor & taste is disposed off with Q.A department's instructions either for blending or for reprocessing.

7.19.9 Ghee having greasy texture & body is segregated, reprocessed and cooled to obtain good granules.

D) Milk Powder (SMP, WMP & DW)

7.19.10 Powder having more than 4 % moisture is dry blended.

7.19.11 Powder having 'C' & 'D' grade of sediment is disposed off with the instructions of Q.A (either reconstitution or dry blending).

'A' Grade → Not more than 2 particle in 10 gm. of SMP

'B' Grade → 3-6 Particles in 10 gm of SMP

'C' Grade → 7-10 Particles in 10 gm of SMP

'D' Grade → More than 10 particles in 10 gm of SMP.

7.19.12 SMP sweepings from stack loss recovery room, chamber ducting & floor sweeping is reconstituted.

7.19.13 Cake powder as a result of torn bags, high temperature of filling is reconstituted or disposed off as poultry feed after inspection by technical committee.

E) Liquid Milk

7.19.14 In case MBR time of pasteurized milk is less than 5.0 hrs. matter is referred to Technical committee for final decision.

7.19.15 Good milk returned from pouch filling machine is reprocessed.

7.19.16 Skimmed milk with fat above 0.1 % is re-processed.

F) Bacteriological Quality Variations

7.19.17 Table Butter / White Butter having coliform & Y & M count more than specified norms is converted into ghee.

7.19.18 SMP having Standard Plate Count (SPC) more than 50,000 /gm is reconstituted and reprocessed as per directions of technical committee.

G) Milk Powder

7.19.19 SMP having fat % more than 1.5 % is reconstituted.

7.19.20 Whole Milk Powder having fat % less than 26 % is reprocessed.

H) Indigenous Products

7.19.21 If indigenous products namely curd, Lassi, Sweetened flavored milk, Milk cake & paneer does not conform to IBI specifications in respect of chemical and bacteriological standards, matter is referred to technical committee for final decision.

7.20 R & D ACTIVITIES

7.20.1 R & D activities are carried out to develop new products and improvement in the packaging material as per requirement from time to time. Following steps are followed for development of new products.

7.20.2 Analysis of competitor's brand.

i) Product samples of reputed competitors drawn from market are analyzed for various chemicals and bacteriological parameters.

ii) On the basis of results, trials are carried out in Q.A laboratory to achieve the same parameters in respect of taste / flavor, chemical & bacteriology.

7.20.3 Testing Marketing

i) When consistency in quality is achieved, test marketing (market research studies) is carried out to get the feed back.

ii) Based on the feed back, the process parameters are changed and product is manufactured again. The blank tests are carried out at Q.A level and market level to ascertain the quality of product matching with competitor's products. If feed back from market is OK then further action is initiated.

7.20.4 Shelf Life Study

i) Shelf life study is carried out to check the life of the products before launching the product in the market.

7.20.5 Process Control
Step-wise procedure for manufacturing of product is defined to achieve the consistency in the finished product.

7.20.6 Packaging Material
Suitable packaging material is developed to achieve the optimum shelf life of the product

7.20.7 Production Cost

The production cost of the product taking in consideration the material cost, mfg. cost & packaging material is calculated.

7.21 Analysis of Competitor's Brand Comparison with Our Brand

7.21.1 From time to time and as per need, the samples of milk & milk products of reputed brands are collected from market, various tests in respect of organoleptical, chemical and bacteriological test are performed and compared with those of our own product. In case, it is found that competitor's brand has better quality parameters then trials are carried out to incorporate the same in our own milk and milk products. Results are recorded in QMQ-29

7.22 Returned Milk & Milk Products from Market

7.22.1 Whenever unsold products are received from market, depots or institutions due to any reasons, these are analyzed for quality parameters if found satisfactory, these are declared fit for dispatches. If product found to be unsuitable for dispatches then matter is referred to Committee for necessary action.

7.23 Reception of Husk Vehicle.

Husk samples are drawn by Lab. representative from vehicle standing out the main gate. The samples are analyzed for moisture % and dust. If results conform to IBI specifications then vehicle is allowed inside the factory for unloading, otherwise it is rejected.

After half unloading, final sample is drawn by QA department for final testing. If results conform to IBI specifications, Husk vehicle is accepted. If results do not meet IBI specifications, matter is referred to technical committee for final decision.

Husk specifications are mentioned in Annexure 'T'.

7.24 CONTROL OF NON-CONFORMING PRODUCT

7.24.1 All preventive steps in process during manufacturing of milk and milk products are taken to ensure that milk and milk products conform to legal / MLS specifications. System of HACCP has been implemented for various products to ensure consistency in the quality of milk and milk products.

7.24.2 In case, finished products quality does not conform to PFA / BIS / IBI specifications, the mater is referred to standing committee comprising of GM (W), Manager (Prod.) and HOD (QA) to investigate the matter. Committee will find out the reasons for substandard product and initiate preventive steps to ensure that recurrence is avoided.

7.24.3 Decision taken by committee for disposal of products is recorded in the register QMQ-32 and decision is communicated to concerned department for necessary action. Corrective and preventive measures in respect of non-confirmation of products are also recorded in the QMQ-32 register.

7.25 CONTINUAL IMPROVEMENT

7.25.1 The norms for prime performance parameters for QA department have been specified at Annexure – "X". Performance of each prime performance parameter is reviewed monthly by management. In case, it is found that performance is below norms, matter is investigated thoroughly and preventive actions are taken to meet the norms of prime performance parameters.

7.26 HUMAN RESOURCES

7.26.1 Training needs for the individual staff is determined by HOD (QA). Training is imparted to the staff as per the requirements. Special training programs are conducted for QA and procurement staff during lean season. Training program schedule is given at Annexure – "Y"

7.27 CUSTOMER FOCUS

7.27.1 Management shall ensure that consumer requirements are determined before supplying consignment for their satisfaction.

7.28 CUSTOMER SATISFACTION

7.28.1 The organization is monitoring the feed back related to customer's perception regarding quality of milk and milk products. Feed back from customer's regarding quality of milk and milk products are taken on monthly basis as per the specified format at Annexure – "V". Feed back taken from customers is scrutinized by the standing committee. In case, it is found that there is deficiency in the product quality, the corrective action is initiated to improve the quality. If required HOD (QA) or committee members interact with the customers to ascertain the facts.

7.29 MONITORING AND MEASUREMENT OF PRODUCTS

The specification of different milk and milk products have been specified at Annexure – "H, I, K, L, M, N & O". It is ensured that milk and milk products meet the PFA, ISI and Agmark specifications for designated products. The organization has prepared it's own specifications of milk and milk products which are better than legal specifications. Concerted efforts are being made to achieve IBI specifications of milk products to meet the customer's requirements.

7.29.1 Hazard Analysis Critical Control Points have been identified for each product to maintain consistency in milk and milk products. Various tests are carried out on line to ensure quality of milk and milk products as per Annexure "A". When it is ensured by Quality department that milk and milk products conform to IBI specifications then quality certificate is issued to production department and store department stating that product is suitable for dispatches. In case product does not meet specified standards, the production department is intimated. The matter is referred to standing committee for final decision and corrective action is initiated to avoid recurrence in future.

8.1 ANALYSIS OF RAW MIILK

8.1.1 GERNERAL

Sampling of milk is done by the Laboratory (Lab.) Attendant / Lab. Assistant. The method of sampling varies according to the purpose for which the sample is collected & the tests, which are to be carried out for chemical examination. The sampling equipment is to be cleaned and dried.

The following appliances are required for sampling.

a) Plunger
b) Sampling dipper

These are preferably made of stainless steel. The surface shall be smooth & free from crevices or projections.

8.1.2 SAMPLING FROM INDIVIDUAL CONTAINER

a) Contents are mixed thoroughly with plunger.

b) The plunger is allowed to fall to the bottom of the container and brought to the top of the milk as rapidly as possible not less than 10 times.

c) Any milk fat adhering to the neck and under the shoulder of can is well mixed with remainder of milk.

d) After thorough mixing, a sample is drawn immediately.

8.1.3 SAMPLING FROM SEVERAL CONTAINERS

Composite sample is obtained by taking the same proportions of milk their in from each equally filled container in a consignment after thorough mixing.

8.1.4 SAMPLING FROM BULK UNITS

When milk of uniform quality is supplied in bulk units (for example, can filled from storage tanks), the number of random units are sampled as follow :-

Total No. of Units	No. of Units to be Selected
1	1
2 to 5	2
6 to 20	3
21 to 60	4
61 to 100	5

8.1.5 SAMPLING FROM MILK TANKERS

a) Milk in tanker is thoroughly mixed by sufficient plungering.

b) The plunger is thrust forward and pulled back.

c) The cycle of plungering is continued for at least 8 – 10 minutes.

d) After proper mixing sample is drawn.

8.1.6 SAMPLING FROM STORAGE TANK

i) Milk in storage tank is thoroughly mixed with the help of mechanical agitator for 20 – 25 Mts.

ii) Before drawing milk sample from sample cock, app. 5-litre milk is taken out in bucket.

iii) App. 250 – 300 ml of milk sample is taken in sample bottle.

iv) Temperature of milk is also recorded.

8.1.7 ORGANOLEPTIC TEST

Adopt the following procedure on receiving the milk at reception dock.

i) Smell the milk in container immediately after removing the lid. In case of foul/ abnormal smell, hold the same for Confirmation tests i.e. acidity, alcohol test & COB test.

ii) Observe the color of milk, if abnormal in color, it should be regarded with suspicion and hold for confirmatory test. (Alcohol Test & acidity test)

iii) Examine the milk for other parameters

a) Developed acidity: This is the most important factor to be examined when grading milk by organoleptic test.

b) Undesirable flavor: This is due to feed or exposure of milk to the atmosphere of stable.

c) Extraneous matter which might gain access to milk after milking.

d) Oxidized flavor due to exposure of milk to light or metallic contamination from untinned container.

e) Neutralized flavor: When high acidity milk is neutralized with Sodium Carbonate group of Neutralizer, milk develops flavor resembling to soap.

8.1.8 DETERMINATION OF pH

General

The pH of Buffalo milk ranges from 6.6 to 6.8 and on average cow milk has pH 6.6. Milk having pH above 6.8 should be regarded with suspicion as indication of some diseases of udders or late lactation of milk and neutralization of milk with Sodium Carbonate or sodium Hydroxide.

pH is determined by digital pH meter.

a) Calibrate the pH meter with standard buffer solution of pH 4.0 and 7.0.

b) Dip the electrode of the pH meter in milk sample, which have been thoroughly mixed.

c) Note the pH reading.

d) Remove the electrode and wash it properly with distilled water.

e) After checking PH of sample, electrode is to be dipped in distilled water.

f) If sodium ions of milk are carried out than pH is not required.

8.1.9 CLOT ON BOILING

a) General

This is quick method to determine developed acidity and suitability of milk for processing.

b) Apparatus

i) Test tube - 15 .0 x 1.9 Cm preferably with a mark of 5 ml .
ii) Burner.

c) Procedure :

i) Transfer 5 ml of milk in a test tube and smell.
ii) Place the tube on the flame of the burner with constant mixing of the contents till boils.
iii) Remove the tube and rotate it in horizontal position. Cool down the tube with running tap water.
iv) Examine the film of milk on side of the test tube for any precipitate particles.
v) The formation of clot is an indication of positive test.

d) Inference

Milk which gives COB positive test has an acidity above 0.17% (as lactic acid) is not suitable for processing.

8.1.10 ALCOHOL TEST

a) General

The alcohol test is used for rapid assessment of stability of milk for processing, particularly for condensing and sterilization. The alcohol test is useful as an indication of mineral balance of milk and not so much as an index of developed acidity.

b) Apparatus

Test tubes – 15.0 X 1.9 cm

c) Reagents

60 % rectified alcohol by volume (density 0.8675 gm / ml at 27 deg. C.

d) Procedure

i) Take 5 ml of milk in a test tube
ii) Add 5 ml of alcohol (60 %)
iii) Mix the contents of the test tube by inverting few times.
iv) Note any flakes and clot.
v) The presence of a flakes or clot denotes a positive test.

e) Inference

A negative test indicate low acidity and good heat stability of the milk. Milk showing positive test is not considered suitable for the manufacture of sterilized milk.

8.1.11 ACIDITY

A) Apparatus
i) Beaker 100 ml.
ii) N/10 standard NaOH solution (sol.)
iii) Stirring rod.
iv) Phenolphthalein indicator (0.5%)

B) Procedure

i) Mix the sample thoroughly.
ii) Measure accurately 10 ml of milk in a beaker.
iii) Add 1 ml of phenolphthalein indicator.
iv) Rapidly titrate the contents of beaker to which phenolphthalein indicator has been added with standard sodium hydroxide solution drop by drop until light pinkish color appears.
v) Complete the titration within 20 seconds.
CALCULATIONS: - ml of 0. IN Noah used X 0.09
vi) Inference :- The normal acidity of milk ranges form 0.12% to 0.144 % (at9%snf)

8.1.12 DETERMINATIN OF FAT
GERBER METHOD

a) Apparatus

i) Milk Butyrometer (ISI)
ii) Gerber Centrifuge
iii) Hot water bath maintained at 65 deg C.
iv) Automatic measure for H2SO4 / Tilt Measure
v) Milk Pipette (10.75 ml)
vi) Automatic measure for Amyl Alcohol.

b) Regents

i) Sulfuric acid – It should have a density of 1.807 to 1.8.12 gm / ml at 27 deg C corresponding with a concentration of sulphuric acid from 90 – 92 % by mass. Color shall be colorless or not darker than pale amber in color.

ii) Iso Amyl Alcohol – Amyl Alcohol should be colorless, distilled between 128 deg C to 132 deg C, density 0.8030 to 0.8050 gm / ml at 27 deg C.

c) Procedure

i) Take 10 ml of sulphruic acid with the help of tilt measure into well-cleaned butyrometer.

ii) Pipette out 10.75 ml of the well-mixed milk sample which is previously heated to 40 deg C & then cooled to 27 deg C and transfer it to the butyrometer without allowing it to mix with acid.

iii) Add 1 ml of Iso – Amyl Alcohol.

iv) Tighten the stopper and mix the contents by shaking the butyrometer at 45 deg C till the curd has been dissolved.

v) Place the butyrometer in the centrifuge machine and balance the machine and centrifuge for 3 – 4 minutes at full speed.

vi) After centrifugation, transfer the butyrometer in water bath at 65 deg C + / - 2 deg C for 5 minutes.

vii) Take the accurate reading after adjusted fat column.

8.1.13 FAT ESTIMATION BY GRAVIMETRIC METHOD

a) Apparatus

i) Fat extraction tube (Majonnier Tube Extraction)

ii) Well ventilated electrically heated oven (98 deg C to 100 deg C)

iii) Dishes

b) Regents

i) Con. Ammonia Solution. (Sp. Gravity 0.88)
ii) Ethyl Alcohol 95 to 96 % (V/V)
iii) Light Petroleum – boiling range 40 to 60 deg C
iv) Mixed solvent – prepared by mixing equal volumes of the ether and light petroleum.
v) Diethyl ether (sp.gravity 0.720) peroxide free)

c) Procedure

i) Weigh accurately 10 gms of well-mixed sample of milk into extraction tube.

ii) Add 1 ml of conc. Ammonia solution and mix well in lower bulb.

iii) Add 10 ml of alcohol and mix by allowing the liquid to flow backward and forward between the two bulbs. Allow the tube to cool in cold running water.

iv) Add 25 ml ether, close with the glass stopper which is wetted with water before insertion and shake vigorously for one minute.

v) Open the tube and add 25 ml of light petroleum, close the tube and shake vigorously for one minute. Allow the tube to stand on the flat bottom of the lower bulb until the ether layer is clear and completely separated from the aqueous layer, usually not less than 30 ml or centrifuge until clear.

vi) Carefully decant supernatant layer as much as possible into a suitable flask. After pouring, wash the outside of the neck of the test tube and stopper with mixed solvent collecting the rinse in the flask. Wash inside of the neck with 4 to 5 ml of mixed solvent and decant.

vii) Repeat the extraction of the milk residue and the subsequent operations but using 15 ml di ethyle eather and 15 ml of petroleum eather and finally repeat the extraction and subsequent operations once more with 15 ml each of the ether and petroleum.

viii) Distil carefully the solvents from the flask and dry the residual fat in the oven at 98 to 100 deg C for 1.0 hr. to remove water.

ix) Cool the flask to room temperature in a dessicator and weigh it.

x) Repeat heating, cooling and weighing until successive weighing do not differ by more than 1 mg.

xi) Extract the fat content completely from the flask by repeated washing with light petroleum allowing any sediment to settle before each decantation, dry the flask in oven, cool and weigh as before.

xii) Make a blank determination using the specified quantities of reagents throughout and water in place of milk and deduct the value found if any, from the apparent weights of fat.

d) Calculations

i) Weight of the weighing bottle with milk before transfer ... A gm

ii) Wt of weighing bottle with the remaining milk after transfer ... B gm

iii) Wt of milk taken for analysis ... B – A gm

iv) Wt of empty flask ... C gm

v) Wt of flask + dried fat ... D gm

vi) Wt of dried fat ... D – C gm

vii) Wt of fat in the flask used for blank test. ... Z gm

viii) % of fat in milk = [(D - C - Z) X 100] / (B – A)

8.1.14 ESTIMATION OF FAT OF CREAM

a) Apparatus

i) Butyrometer – 70 % scale.

ii) Sulphuric acid – Density – 1.807 to 1.812 gm / ml at 27 deg C corresponding with a concentration of sulphuric acid from 90 to 91 % by mass.

iii) Amyl Alcohol – ISI Grade.

b) Procedure

i) Mixing of sample

Stir the sample thoroughly but not so vigorously as to cause undue froth or churning, warm the sample to 30 deg to 40 deg C to facilitate mixing, Mix immediately before weighing the required amount of cream for the test.

ii) Transfer 10 ml of sulphuric acid into butyrometer.

iii) Mix and immediately weigh 5 + / - 0.01 gm of cream sample into butyrometer without soiling neck.

iv) Add about 6 ml of hot water (70 deg) to the butyrometer)

v) Transfer 1 ml of Amyl Alcohol and add hot water required to adjust level.

vi) Close the neck of butyrometer with stopper.

vii) Shake the butyrometer carefully without inverting it until the contents are thoroughly mixed, then invert the butyrometer a few times to mix the contents thoroughly.

viii) Keep the butyrometer in water bath maintained at 65 deg C + / - 2 deg for minimum 3 mts.

ix) Centrifuge at maximum speed for 4 mts.

x) Transfer buytrometer to water bath maintained at 65 deg C + / - 2 deg C for minimum 3 mts.

xi) Read the butyrometer for fat %.

8.1.15 ESTIMATION OF FAT FOR MILK POWDER BY GERBER METHOD

a) Procedure

i) Take 10 ml of Sulphuric Acid in butyrometer.

ii) Add gently tap water to form layer of about 6 mm deep on the top of the acid.

iii) Mix sample thoroughly and weigh 1.69 + / - 0.01 gm of milk powder into the beaker.

iv) Add 5 ml (appx.) Hot water in the beaker & mix the contents thoroughly.

v) Transfer the contents to the butyrometer avoiding charring of fat.

vi) Rinse the beaker with few ml of water & transfer the contents to butyrometer.

vii) Add 1 ml of Amyl Alcohol into the butyrometer.

viii) Add hot water (70 deg C) from the wash bottle, if required.

ix) Follow the procedure as prescribed in the estimation of fat of milk by Gerber Method.

b) Calculation

% milk fat = Fat % X 20 / 3

8.1.16 DETERMINATION OF SNF USING LACTOMETER

a) Apparatus

i) Lactometer
ii) Lactometer Jar.
iii) Thermometer (Standard)

b) Procedure

i) Warm the milk sample at 40 deg C & maintain at this temp. for 3-5 minutes.

ii) Mix the contents by inverting the sample bottle upside down and vice versa by taking care to avoid the formation of bubbles foam.

iii) Cool the sample approximately to the temperature at which the lactometer reading is required to be taken.

iv) Insert lactometer gently to wet the steam and allow the lactometer to remain steady in milk. Take the reading within 30 seconds. Note the reading of the lactometer corresponding to the top meniscus on the stand without any error and parallax.

v) Note the temperature of milk.

vi) Obtain the correct lactometer reading by applying approx. correction factor.

c) Formulae

1) % SNF = (CLR / 4) + 0.2 F + 0.29 (for VLC milk)

where CLR = Corrected Lactometer Reading at 15.5 deg @

2) % SNF = (CLR / 4) + 0.2 F + 0.14 (for contractor's milk)

where CLR = Corrected Lactometer Reading at 15.5 deg C (NPL lactometer)

8.1.17 DETERMINATION OF SNF BY GRAVIMETRIC METHOD

a) Apparatus

Shallow flat bottom dishes of Aluminium alloy / nickel / stainless steel having 7 to 8 cm diameter & about 1.5 cm in height and provided with easily removable but closely fitting lids.

b) Procedure

i) Weigh accurately the clean dry empty dish with lid.

ii) Pipette into dish about 5 ml of milk sample & weigh accurately with the lid on.

iii) Place the dish uncovered on a boiling water bath at least for 30 minutes.

iv) Remove the dish from water bath, wipe the bottom & keep the dish in the hot air oven over a silica triangle maintained at 98 to 100 deg C placing the lid by the side of the dish.

v) After 3 hours, cover the dish & immediately transfer to a dessicator.

vi) Allow to cool for 15 to 20 minutes (approx.)

vii) Weigh the dish along with lid.

viii) Return the dish uncovered & the lid to the oven & heat for one hour.

ix) Remove to the dessicator, cool & weigh as before repeat if necessary until the loss of weight between successive weighing does not exceed 0.5 mg. Note the lowest reading.

c) Calculations

Total solids % by wt. = 100 x W1 / W2

Where W1 = Weight in gms of the residue after drying
W2 = Weight in gms of sample

DETECTION OF ADULTRANTS

8.1.18 DETECTION OF SKIMMING

An indication of the removal of excess fat from the milk is given by the following :

a) Lower %age of fat
b) Higher density reading of sample
c) Higher ratio of solids-not-fat(SNF)

8.1.19 DETECTION OF EXTRANEOUS WATER

Presence of extraneous water in milk is detected by the following facts :

a) Lower %age of fat
b) Lower density of milk at 27 deg.C
c) Lower %age of solids not fat
d) Depression in freezing point.

8.1.20 SUGAR [FIRST METHOD]

a) Procedure

i) Resorcinol solution - Dissolve 11 gm Resorcinol Powder in 100 ml. Distilled water.
ii) Take 10 ml of milk in test tube.
iii) Add 1 ml. Resorcinol solution and mix well.

iv) Add 2 ml. Conc. Hydrochloric acid (HCL) & mix well.
v) Keep the test tube in boiling water bath for 5 mts.

b) Inference: - Appearance of brick red color or pink color indicates the addition of sugar in the milk sample.

SECOND METHOD

a) Reagents

Dissolve 1.0 gm. of resorcinol in 100 ml. HCL (1:1.5) i.e. 1 volume of con. HCL mixed with 1.5 volume of water.

b) Procedure

i) Take 50 ml. of milk sample and heat it to 50 - 60 deg. C.

ii) Add 10% citric acid sol./ HCL slowly to coagulate the milk till greenish color appears.

iii) Filter the coagulate.

iv) Take 2 ml. of filtrate in a test tube and add to it 5 ml. of resorcinol solution and mix.

v) Place the test tube in boiling water exactly for two minutes.

vi) Observe the color.

c) Inference

Rose pink color indicates the presence of sucrose or a ketoses sugar.

8.1.21 GLUCOSE

First method

a) Procedure

i) Take 5 ml of milk sample in test tube.

ii) Add 5 ml of Barford reagent and boil for 3 mts. in boiling water bath and then cool to room temperature.

iii) Add. 5 ml of phosphomolybdic acid & mix the contents.

b) Inference:- Appearance of deep blue color indicates +ve test

Second method

c) Procedure

i) Take 5 ml of milk sample in test tube

ii) Add 0.5 ml of copper acetate solution (6% in 1% acetic acid sol.)

iii) Keep the test tube in boiling water bath for 3 to 5 minutes.

b) Inference: - Appearance of Blue Color indicates + ve test.

A) ADULTRANTS :

Glucose test

i) Take properly mixed sample in a beaker.

ii) Dip reagent end of diastix strip and remove it immediately.

iii) Tap edge of strip against container to remove excess of milk.

iv) Match the color with standard color band to check the extent of adulteration.

8.1.22 STARCH

a) Procedure

i) Take 5 ml of well mixed sample in test tube.

ii) Bring it to boiling by holding the tube over a flame.

iii) Allow it to cool at room temperature.

iv) Add 3 or 5 drops of Iodine Solution (1%) (1 g. iodine + 2g. Potassium Iodide)

b) Inference: - Presence of starch indicated by appearance of blue color, which disappears when the sample is boiled and reappear on cooling.

8.1.23 UREA

First Method

a) Procedure

i) Take 5 ml of milk in test tube.

ii) Add 5 ml of Dimethyl Amino Benzaldehyde (D.M.A.B) Solution. (DMAB Solution: Dissolve 16 gm DMAB in 1000 ml. of Ethyl Alcohol. Add 100 ml. CON.Hcl)

iii) Mix the contents.

b) Inference :- Appearance of yellow color shows test +ve

Second Method

i) Take 5 ml of milk in test tube.

ii) Add 1 gm of soyabean powder and mix well.

iii) Keep the test tube for 25 minutes at 37 deg C.

c) Inference: - Appearance of blue color on the PH strip paper shows the test +ve.

Third Method (AOC)

a) Reagents

i) **D.M.A.B. Sol.** - Dissolve 16 gm D.M.A.B. Powder in 1 ltr. alcohol and add 100 ml HCl (Conc.)

ii) **Zinc Acetate Solu:** Dissolve 22 gm Zinc Acetate in distilled water and 3 ml acetic acid. Dilute this solution to 100 ml quantity.

iii) Pot. ferrocyanide solu: Dissolve 10.6 gm powder in water and dilute to 100 ml.

b) Procedure

i) Take 50 ml. milk

ii) Add 50 ml. Distilled water (D.W.)

iii) Add 5 ml. potassium ferrocyanide solution.

iv) Add 5 ml. zinc acetate solution. It will get curdled then filter it.

v) Take 5 ml filtrate.

vi) Add 5 ml D.M.A.B. Solution & mix.

c) Inference

Light Yellow - ve Test
Dark Yellow + ve Test

8.1.24 MALTO - DEXTRIN

A. a) Procedure

i) Take 5 ml. of milk in test tube.
ii) Add 5 ml. of phosphomolybdic acid.
iii) Add 10 drops of iodine sol. (1%)

b) Inference: Appearance of Brown Color shows +ve test.

B. a) Procedure

i) Heat 10 ml. milk sample.
ii) Add acetic acid to coagulate.
iii) Separate whey by filter.
iv) Take 3 ml. milk filtrate, add three drops 1 % iodine solution.

b) Inference: Appearance of Brown Color shows +ve test.

8.1.25 SALT

a) Procedure

i) Take 5 ml of Silver Nitrate (N/70) Sol. in a test tube.

ii) Add 0.5 of pot. chromate sol. (5%)

iii) Add 2 ml of milk sample and mix the contents.

b) Inference: - Appearance of yellow color shows positive test.

8.1.26 MAGNESIUM SULPHATE

a) Reagent
Barium chloride (10% solution)

b) Procedure

i) Take 5 ml. filterate of milk sample.

ii) Add 1 ml. of Barium chloride sol. and mix the contents.

iii) Keep the test tube undisturbed for 30 mts.

c) Inference

Appearance of white precipitate at the bottom of the test tube indicates positive test.

8.1.27 DETERMINATION OF LACTOSE CHEMICALS

1. FEHLING A

Dissolve 34.639 gms of Cupric Sulphate in distilled water and make up the volume to 50 0 ml. with distilled water. Keep it for 24 hrs and filter the solution.

2. FEHLING B

Weigh 173 gm of potassium sodium tartarate and 50 gm of sodium hydroxide. Dissolve in distilled water and make up the volume to 500 ml Keep it for 24 hrs and filter the solution.

3. METHYLENE BLUE:

Weigh 0.2 gms of methylene blue powder and dissolve in 100 ml distilled water.

4. STANDARD LACTOSE SOLUTION (0.5%)

Weigh accurately 2.5 gm of Lactose (A.R) previously heated at 130 C for 2 hrs. Dissolve in distilled water and make up volume to 500 ml.

5. STANDARDISATION OF FEHLING A & B SOLUTION

i) Take 5 ml.of each fehling A & B solution in conical flask and heat to boil.

ii) Add 13 ml. (Appx.) of standard lactose solution (0.5%).

iii) Allow the liquid to boil for 1 minute.

iv) Add 1 ml of Methylene blue (0.2 %) indicator.

v) Again add standard lactose solution drop by drop till blue color disappears.

vi) Note down the ml. of standard lactose solution used.

CALCULATIONS: FACTOR = VOL. USED X 5

PROCEDURE

1. Take 10 ml.of milk in 100 ml.volumeteric flask. Heat to 70°C and co-agulate with 10% citric acid solution. Make up the volume to 100 ml. and filter it.
2. Pour filterate into 50 ml. burette.
3. Pipette out 5 ml. of each Fehling A and Fehling B solution into a 250 ml. conical flask, add 10 ml. distilled water and heat to boil on the heater.
4. Run from the burette 14 ml. of filterate into boiling fehling's solution.
5. When it is observed that all copper is reduced (imparting red color to the boiling liquid), add 1 ml. methylene blue indicator.
6. Boil for more one minute and add filtrate in small quantities (0.5 ml.at a time) allowing the liquid to boil for 10 to 15 seconds between successive addition till blue color of the indicator just disappears.

$$\% \text{ LACTOSE} \quad : \quad \frac{\text{FACTOR}}{\text{TITRE VALVE}}$$

8.1.28 DETECTION OF BORIC ACID/BORAX.
METHOD - I

a) Reagents : Turmeric paper, Conc. HCl-sp.gravity 1.16, Ammonium Hydroxide - sp.gravity- 0.88.

b) Procedure

i) Take 5 ml of milk sample in a test tube.

ii) Add about 0.5 ml of conc. HCl.

iii) Immerse a strip of turmeric paper in a milk sample.

iv) Allow the paper to dry spontaneously and note change in color.

c) Inference

If boric acid/borax is present, the paper will acquire red color.

METHOD - II

a) Procedure

i) Take 10 ml of milk sample in test tube.

ii) Add 3-4 drops of phenolphthalein indicator.

iii) Add 0.1 N NaOH sol. to get faint pink color.

iv) Divide the neutralized sample between two test tubes.

v) Add to one sample an equal amount of water.

vi) To the other test tube, add an equal volume of glycerine sol. (50% W/v).

vii) Compare the colors.

If the color of the milk-containing glycerin is lighter than the other in which water is added, it is an indication of the presence of boric acid. The milk containing the glycerine will turn completely white, if the amount of boric acid is considerable accurate upto o.1% boric acid.

c) Confirmation

The addition of ammonium hydroxide will change the color of the paper to a dark green but HCl may restore the red color.

8.1.29 DETECTION OF GLYCEROL

i) Take 20 ml of milk in a beaker.

ii) Add 1 ml. phenolphthalein indicator.

iii) Add N/10 Sodium hydroxide solution dropwise till pink color appears.

iv) Divide equally in two test tubes and add 1 ml. of boric Acid solution.

Inference – Color of the solution in test tube to which boric acid solution is added disappears or is lighter than comparison tube.

8.1.30 DETECTION OF FORMALDEHYDE BY HEHNER TEST

Reagents : conc.H2SO4 - sp.gravity 1.84

a) Procedure

i) Take about 10 ml of milk sample in a wide mouth test tube.

ii) Add 5 ml. of conc. Sulphuric Acid carefully down the side of the test tube so that it forms a layer at the bottom without mixing with the milk.

b) Inference: Development of violet or or or blue color at the junction of the two layers indicates presence of formaldehyde.

8.1.31 DETECTION OF HYDROGEN PEROXIDE

METHOD - I

a) Reagent

Paraphenyldiamine solution 2% (W/V)

b) Procedure

i) Take 10 ml.of milk sample in a test tube.
ii) Add 5 drops of para- phenylene- diamine solution and mix thoroughly.
iii) Observe the change in color.

c) Inference

Development of blue color indicates presence of hydrogen peroxide.

SECOND METHOD (AOC)
HYDROGEN PEROXIDE

a) Procedure

i) Take 10 ml of milk in test tube.

ii) Add 1 ml of vanadium pentaoxide (1% sol.) in it & mix the contents.

b) Inference: - Appearance of violet/blue colors shown the presence of Hydrogen Peroxide.

8.1.32 DETECTION OF NEUTRALIZERS

A) Reagents
Rosolic acid (1% in alcoholic sol.)

B) Procedure

i) Take 5 ml of milk sample in a test tube.

ii) Add 5 ml of 60% Alcohol & mix well.

iii) Add 3 drop of rosolic acid solution & observe change in color.

c) Inference: - Development of Rose Red Color or pink color indicates presence of neutralizer in milk where as pure milk shows only a brownish coloration.

8.1.33 DETERMINATION OF TOTAL ASH OF MILK (On dry basis)

Neutralization of milk whether with lime, soda ash or caustic soda invariably increases the ash content and total alkalinity of the ash from a fixed quantity of milk. (Procedure same as 8.2.7 Page No.B1-09).

8.1.34 DETERMINATION OF SODIUM IONS OF MILK & MILK PRODUCT

a) Preparation of Standard Solution

i) To prepare 1000 PPM solution, take 1.271 gm. of anhydrous sodium chloride (AR) in a beaker which has already been dried in over at 140 degree. C. for 2 hrs.

ii) Dissolve the sodium chloride and make up volume up to 500 ml with distilled water.

iii) Transfer the solution immediately in plastic container.

iv) To prepare 100 PPM standard solution, take 10 ml. of 1000 PPM solution, dilute it to 100 ml.with distilled water.

b) Preparation of Liquid ISA

i) Dissolve 20 gm Analytical Reagent (AR) grade Ammonium chloride in 50 ml. of distilled water.

ii) Add 27 ml. of concentrated ammonium hydroxide.

iii) Dilute to 100 ml with distilled water. This Ionic Strength Adjuster (ISA) is used by adding 1 ml ISA per 50 ml. of milk sample

c) Calibration of Apparatus

i) Prepare a standard solution of 100 and 1000 PPM of Sodium Chloride.

ii) Add 1 ml. ionic strength adjuster (ISA) in 50 ml. of 1000 PPM standard solution maintained at 25 degree. C.

iii) Connect the electrode to the meter and press the mode key until the conc. mode indicator is displayed.

iv) Place the electrode in the standard solution.

v) Mix the solution by magnetic field and add drop of Ammonium chloride gel by pushing gun of the electrode.

vi) Press the CAL key, Slope of the last calibration will be displayed. After a few second P1 will be displayed in the lower field indicating the meter is ready for the standardization.

vii) Place the electrode in the standard solution and wait for stable reading. The meter will beep and the main field will flash when ready. Enter the value of the standard by scrolling through the choices with arrow key. Press yes key to enter the desired digit. The display will freeze for a few seconds when P2 will be displayed in lower field.

viii) After correct value for P1 is entered, P2 will be displayed in lower field. Rinse and blot the electrode (S) and place in the second standard (100-PPM) and carry out the same procedure as defined above.

ix) If the slope comes in the range of 58-+3 vol., this his indicate that apparatus is calibrated properly.

N.B. - The temperature of solution is kept at 25 degree.
C., in case temp. probe is not in use

d) Checking of Sodium Ions Of Milk Sample

i) Take 50-ml. milk sample in a measuring cup, which has already been warmed to 25 degree. C.

ii) Add 1.0 ml. ionic strength adjuster. Place clean, dried magnetic in the measuring cup.

iii) Mix the milk using magnetic field.

iv) Add drop of ammonium chloride gel by pushing gun of the electrodes.

v) Switch on the meter.

vi) Take sodium ions reading till reading become constant (2-3 Mts.)

vii) Rinse the electrode with Ammonia Solution (0.2%) and wipe out with tissue paper. Keep the electrode dipped always in 1000 PPM sodium ions solution.

viii) **TROUBLE SHOOTING CHECK LIST**

S. NO	SYSTEM	POSSIBLE CAUSE	REMEDY
A.	SLOW RESPONSE	A) GLASS NEEDS TO BE CONDITIONED	SOAK IN STORAGE SOLUTION OR STANDARD WITH ISA
		B) GLASS BULB IS COATED	CLEAN BULB
		C) CORRODED GLASS	SOAK IN HCL FOR 15 MTS ENSURE REFERENCE ELECTUBE IS CAPPED ON COMBINATIONS ELECTORDES
B.	LOW SLOP OR ON SLOOPE	A) STANDARDS MODE INCORRECTLY	PREPARE NEW STANDARD & CHECK PROCEDURE
		B) GLASS BULB OR INTERNAL STEAM IS CHECKED	CHECK CLECTODE RESPONSE
		C) INSUFFICIENT CONDITIONING	CONDITION OVERNIGHT IN STOREAGE SOLUTION
		D) INSUFFICIENT CONDITIONING	

8.2 MILK POWDER

8.2.1 Sampling of milk powder and skim milk powder

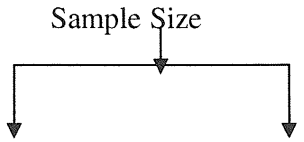
The sample is to be placed in clean and dry glass/ plastic containers. The sample containers are to be completely filled with the sample.

a) Scale of sampling

I) Lot :

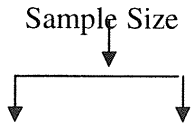
All the containers in a single consignment of same type of material drawn from a single Batch and date of manufacture and of same size shall constitute a lot. If the consignment is declared to consist of different batches of manufacture, the batches shall be marked separately and the group of containers in each batch shall constitute separate lots.

ii) For containers of 500 gm.& upto 5 kg.



Number of Containers In the lot	For Chemical Testing	For Bacteriological Testing
1) Upto 100	3	1
2) 101 to 301	5	2
3) 301 to 500	7	3
4) 501 and above	9	4

iii) For containers of more than 25 kg.



Number of containers in the lot	For chemical Testing	Bacteriological Testing
1) Upto 50	2	1
2) Upto 100	3	1
3) 101 to 300	4	2
4) 301 and above	5	3

b) Preparation of composite sample

From the material taken from each selected container, remaining after the individual sample has been taken, approximately equal quantities of material shall be taken and mixed thoroughly so as to form a composite sample weighing about 200 g.

8.2.2 DETERMINATION OF MOISTURE CONTENT BY INFRA RED APPARATUS.

a) Apparatus

i) Infra red moisture balance
ii) Spatula
iii) Brush

b) Procedure

i) Clean the dish of moisture balance with the help of brush to remove any adherents.

ii) Rotate the knob of the moisture balance clockwise to bring the scale to marking line to hundred and remove the parallax between pointer, reference line and mark of hundred.

iii) Bring back the scale of marking line to zero.

iv) Spray powder sample on the dish uniformly with the help of spatula till pointer comes to marking line of zero. Remove the parallax between pointer, reference line & mark of zero.

v) Switch on the infra red bulb and keep the knob at 100 degree C.

vi) Note temp. from side thermometer when it come to 130 degree C, switch off the infra red bulb. Normally it takes 2 - 3 Mts. for complete evaporation of moisture of sample & powder becomes slightly brownish color.

vii) Move the scale upward and read the moisture directly on the scale by removing parallax between pointer & reference line. The reading of scale at which parallax completely removed, is the moisture %.

8.2.3 METHOD OF DETERMINATION OF MOISTURE CONTENT IN MILK POWDER (IS:11623-1986) (GRAVIMETRIC METHOD)

a) Apparatus

i) Flat bottom moisture dishes of stainless steel, or aluminum with cover having approximate 70-80 mm diameter and 25 mm depth. The dishes to have lids, which fit well and can readily, be removed.

ii) Drying oven: A well-ventilated air oven, thermostatically controlled at 102 +/- 2 dec. The temperature to be uniform throughout the oven.

iii) Dessicator

iv) Self seal polyethylene bags / plastic bottles.

b) Procedure

i) Transfer the whole of the sample of the product to a self-seal polyethylene bag or plastic jar of a capacity of about twice the volume of the sample and mix it thoroughly by rotating and shaking the bottle.

ii) Uncover a dish and place the dish and its lid in the oven at 102 +/- 2 deg. C for one hour. Place the lid on the dish, transfer the covered dish from the oven to the dessicator, and allow it to cool to room temp. And weigh.

iii) Transfer approx. 3 g. of the sample into the dish, cover the dish with the lid and weigh the covered dish accurately and quickly.

iv) Uncover the dish and put it with its lid in the oven at 102 +/- 2 deg. C for 3 hours.

v) Replace the lid, transfer the covered lid to dessicator, and allow it to cool to room temp.and weigh it accurately and quickly.

vi) Heat the uncovered dish and lid in an oven at 102 +/- 2 deg C for further 1 hour replace the lid, allow the covered dish to cool and weigh it. Repeat the process until successive weighing do not differ by more than 0.5 mg. It is usually found that drying is complete after the first 2 hours.

c) Calculation

$$\text{Moisture \% by mass} = \frac{M1 - M2}{M1 - M} \times 100$$

Where M1 = Initial mass in gm of the dish and lid with sample

M2 = Final mass of dish in gm of the dish and lid with material after drying.

M = Mass in gm of empty dish.

8.2.4 ACIDITY OF POWDER

A. Routine Method (Standard Grade Powder)

a) Reagents

i) 0.1N NaOH solution

ii) Phenolphthalein indicator (0.5%)

b) Procedure

i) Weigh accurately 1 gm.of sample powder.

ii) Add 10 ml. distilled water and stir with the flat end of glass rod until a perfectly smooth liquid is obtained.

iii) Cool it to room temp.

iv) Add 1 ml.of Phenolphthalein indicator to the beaker.

v) Titrate against standard 0.1 N NaOH solution till the pink color appears. The time for complete titration must not exceed 20 seconds.

c) Calculations

Titratable acidity as Lactic Acid

$$\% \text{ by mass} = \frac{9\,V\,N}{W}$$

V = Volume of standard NaOH in ml.used for titration

N = Normality of standard NaOH solution

W = Weight in gm.of milk powder taken for the test.

8.2.5 DETERMINATION OF FAT (GRAVIMETRIC METHOD)

a) Apparatus

i) Majonnier fat extraction apparatus

ii) Electric oven: well ventilated and maintained at 100 +/- 1 deg. C.

b) Reagents

i) Conc.Ammonia solution. Approx.35% W/W (sp.gravity 0.88)

ii) Ethyl alcohol - 95 to 96% V/V or denatured spirit

iii) Diethyl ether sp.gravity 0.720 free from peroxide.

iv) Light petroleum - boiling range 40 to 60 deg. C.

v) Mixed solvent prepared by mixing equal volumes of diethyl ether and light petroleum.

vi) Sodium Chloride - 0.5% (W/V)

c) Procedure

i) Weigh accurately about 1 g. of sample powder into a 50ml beaker.

ii) Add 9 ml. of sodium chloride solution.

iii) Swirl gently to disperse

iv) Transfer the content to Majonnier tube with the help of 10-ml.of ethyl alcohol.

v) Add 25-ml.of diethyl ether through the beaker used for weighing sample. Close the tube with stopper.

vi) Remaining procedure is same as estimation of fat of milk by Mojonnier fat extraction apparatus.

8.2.6 DETERMINATION OF INSOLUBILITY INDEX

a) Apparatus

i) Balance- Torsion or simple type approx. 500gm capacity and 0.1 gm.or better sensitivity.

ii) Centrifuge - of required speed (Rev./Minute) with caps to accommodate conical centrifuge tubes.

iii) Centrifuge Tubes

iv) Mixing jar: 500 ml S.S stirring jar

v) Mixer: Conforming to ISI specifications.

vi) Siphon tube

b) Procedure

i) Add 10 gm. (SMP) & 13 gm. (WMP) to 100 ml.of distilled water at a temp. Of 24 deg. C in a mixing jar.

ii) Place the jar in the mixer and stir for exactly 90 seconds.

iii) Allow the sample to stand until the foam has separated sufficiently to permit its complete removal by a spoon. The period of standing after mixing is not to exceed 15 Mts.

iv) Remove the foam with the help of spoon and mix the sample for 5 seconds.

v) Fill up the reconstituted milk to the 50-ml mark.

vi) Centrifuge the tube for 5 Mts. at required speed.

vii) Immediately siphon off the transparent liquid to within 5 ml. of the surface of the sediment level, taking care not to disturb the sediment later.

viii) Add 25 ml.of distilled water at 24 deg. C and shake the tube to disperse the sediment, dislodge it, if necessary with glass rod.

ix) Fill the tube to the 50 ml.mark with distilled water at 24 deg.C.Invert and shake the contents thoroughly.

x) Again centrifuge for 5 minutes.

xi) Hold the tube in a vertical position with the upper level of the sediment on a level with the eye and read the ml. of sediment in the tube to the nearest graduated scale division.

c) Calculations: Report the Insolubility index as the ml of the sediment in the tube.

8.2.7 DETERMINATION OF TOTAL ASH

a) Apparatus

i) Flat bottom dish - silica (50 ml. capacity)
ii) Muffle furnace - maintained at 550 +/- 10 deg. C.
iii) Dessicator

b) Procedure

i) Weigh accurately 3 GMS. of sample in a previously dried and weighed silica dish.

ii) Heat the dish gently on a flame at first till it stops giving smoke.

iii) Place the dish immediately in muffle furnace at 550 +/- 10 deg. C till grey ash results (3-4 hours.)

iv) Cool the dish in a dessicator and weigh.

v) Heat the dish again at 550 +/- 10 deg. C. for 30 mts.

vi) Cool the dish and weigh again.

vii) Repeat this process of heating for 30 Mts. cooling and weigh until difference between two successive weighing is less than one mg.

viii) Record the lowest reading.

c) Calculations

$$\text{Total ash \% by mass} = \frac{100\,(M2 - M)}{M1 - M}$$

Where

M2 = Wt. gms.of dish with ash
M1 = Wt.in gms.of dish with the powder
M = Wt. gm.of empty dish.

8.2.8 DETERMINATION OF PROTEIN

a) Apparatus

Kjeldhal Apparatus

b) Description

The apparatus consists of a round bottom flask (A) of 800 ml. capacity fitted with a rubber stopper through which passes one end of the connecting bulb tube (B). The other end of the B is connected to the condenser, which is attached by means of an adopter to a dip tube (D), which dips into the liquid contained in a beaker of 250 ml.capacity.

c) Reagents

i) Conc.Sulphuric acid - sp.gravity 1.84.(AR Grade)

ii) Copper sulphate

iii) Potassium sulphate or anhydrous sodium sulphate nitrogen free.

iv) Sodium hydroxide solution - dissolve about 225 gm.of NaOH in 500 ml.of water.

v) Standard NaOH 0.1N.

vi) Standard sulphuric acid - 0.1N

vii) Methyl red indicator - dissolve 1 gm.of methyl red in 200 ml.of ethyl alcohol 95 % (V/V).

d) Procedure

i) Weigh accurately 0.5 gm. SMP sample or 5 gm. milk and transfer it to Kjeldhal flask.

ii) Add about 10 gm.of digestion mixture (98 g. Pottasium Sulphate and 2 gm. Cuso4)

iii) Add 25-ml.of conc.H2SO4 through the neck of flask so that it washes the material, if any sticking to the flask.

iv) Add few pieces of glass beads to avoid bumping.

v) Boil vigorously and digest for 60-90 Mts. till the mixture becomes clear and pale green or colorless.

vi) Cool the contents of flask.

vii) Add 200 ml. of distilled water.

viii) Add 0.8 gm. Zinc metal.

ix) Add 80 ml.of NaOH solution (50%) along the side of flask so that it does not mix at once with acid solution but forms layer below it.

x) Attach flask with distillation assembly.

xi) Take 50 ml.of standard H2SO4(0.1N)in a conical glass (250) beaker and add 0.5 ml. methyl red indicator. Place under the condenser taking care that tip of condenser to be dipped in the standard H2SO4 solution.

xii) Start distillation until all ammonia has passed as indicated by the collection of about 150-200 ml.of distillate.

xiii) Titrate the excess acid against 0.1 N sodium hydroxide using methyl red as indicator.

e) Calculation

$$\text{Protein \% by wt.} = \frac{\text{Titre Valve} \times 0.1401 \times 6.38}{\text{Wt. of Sample}}$$

$$\text{Nitrogen \%} = \frac{\text{Protein \%}}{6.38}$$

8.2.9 PROTEIN ESTIMATION BY FORMAL TITRATION METHOD.

A) Liquid Milk

a) Regents

i) Phenolphthalein indicater (1% in 50% alcohol)
ii) Saturated potassium oxalate solution.
iii) Neutralized formalin.
iv) Neutralized distilled water.

b) Procedure

i) 10 ml of a well-mixed sample is taken in a 100-ml beaker.

ii) Add 1-ml phenolphthalein indicator .

iii) Add 0.40 ml. saturated Pottasium oxalate solution & mix well.

iv) The beaker is left undisturbed for 2 Mts.

v) Add 2 ml. neutralized formalin solution (A.R). Mix the contents.

vi) It is titrated against standard 0.1 N NaoH solution to light pink end point.

$$\% \text{ Protein} = \frac{\text{Titer Value} \times 1.71 \times 0.1 \text{ N} \times 100}{\text{Sample weight.}}$$

8.2.10 DETERMINATION OF % LACTOSE IN MILK POWDER

1. Chemicals - Same as in Case 8.1.28

2. Weigh accurately 1 gm milk powder in a beaker & dissolve in small quantity of distilled water.

3. Transfer the contents of beaker into 100 ml measuring flask with washing of distilled water.

4. Heat to 45 Degree C and coagulate with 10 % acetic acid solution. Make up the volume and filter.

5. Take 5 ml of each fehling A and Fehling B solutions in a conical flask. Add 1o ml.- distilled water and glass beads to avoid bumping.

6. Boil the contents on hot plate (on low flame) and add filtrate (not more than 1 ml. at a time) with constant stirring and boiling till red color appears.

$$\% \text{ Lactose} = \frac{\text{Factor}}{\text{Titer Value X weight of sample}} \times 10$$

c) Calculation

% protein (at 9.0 % SNF)

$$\frac{V}{SNF} \times 1.71 \times 9.0$$

Where V = Volume of NaoH used

B) (SMP/WMP/D.W.)

a) Reagents :- Same as above.

b) Procedure

i) Take 1-gm. sample in a beaker.

ii) Add 9 ml. neutralized distilled water .

iii) The powder is dissolved completely with a glass rod.

iv) Add 1 ml. phenolphthalein indicator and followed by 0.4 ml. saturated potassium oxalate solution.

v) The beaker is kept undisturbed for 2 Mts. before adding 2 ml neutralized formalin solution.

vi) Titrate against standard 0.1 N NaoH to a light pink end point.

c) Calculation

$$\text{Protein \% (DB)} = \frac{V \times 1.71 \times 10 \times 100}{96.4}$$

8.3 ANALYSIS OF TABLE BUTTER

8.3.1 ORGANOLEPTIC EVALUATION OF BUTTER

I) Taste & Flavor

It is to be clean, pleasant, free from objectionable taint, and bitter taste. Butter is also to be free from acid, malty, oxidized, rancid, and fishy and tallow flavor.

ii) Body & Texture

Butter is to be firmed at 15 deg.C (60 deg.F). It is not to be greasy, oily, leaky, crumpy or sticky. The texture to be uniform, fine, granular on breaking.

iii) Color, appearance and finish

Color of butter to be uniform and must not allow Streakiness, mottling, stains or any sign of curd.

iv) Free Moisture

Butter not to extrude beads of free moisture on pressing.

v) Salt

Salt to be well dissolved and not too sharp.

vi) Packaging qualities

Packaging is to be neat, clean and tidy showing good finish.

vii) Score Card For Butter (ISI)

The score card system may be used for judging the butter for competition, exhibition . A score card suggested for grading creamery butter is as follows :

	Characteristics	Max.Point	Min.Point
1)	Flavor (clean,free from taint)	50	40
2)	Body and texture at 15 to 16 deg.C (Firm, neither greasy nor oily, and showing granular texture on breaking.)	20	15
3)	Colour,appearance and finish	20	15
4)	Color (even - free from streakiness, mottling, stains or sign of curd.)		
5)	Appearance and finish (bright and clean)		
6)	Moisture (on pressing the butter shall not extrude beads of free moisture		
	Total	100	75

viii) Grading

Score	Quality of Butter
95 or above	Excellent
90 to 84	V.Good
85 to 82	Good
81 to 75	Just acceptable

ix) Apparatus

a) Butter trier to be used for drawing the samples. Butter trier of sufficient length to pass diagonally to the base of the container.

b) Wide mouth jars or bottles of 50 ml. and 100 ml. capacity to be used as sample container.

8.3.2 SAMPLING TECHNIQUE FOR CHEMICAL ANALYSIS

Hard and Semi hard Butter kept under cold storage

a) From Churns

Four cones to be drawn with the help of a trier at equal distances. At least two must be near the center of the churn.

b) From Trolleys

Four cores one each from the two ends and the other two from the sides to be drawn with the help of trier.

c) From Boxes

Three cores to be drawn by inserting a trier vertically through the block. One core must be at the center and other two near diagonally opposite corners of the open end.

d) From small packets

The samples must consist of unopened packets. After taking the sample for bacteriological analysis, the rest to be used for chemical analysis.

e) Sample For Bacteriological Examination

i) From churn or from trolleys with a sterilized or sanitized spatula or trier, take a small amount of butter from not less than four different locations in the churn so that total amount of butter is not less than 100 GMS.

ii) From Boxes and bulk packages:- With a sterilized trier bore diagonally through the container (tub or box) and remove at least two plugs with a minimum total weight of 100 GMS.

iii) From small retail packets - Since there is difference in surface areas of 100, 250 and 500 gm. Packs, remove samples from packet butter with sterilized or sanitized trier in such a manner as to ensure uniformity in surface area per sample. Take 7.5 to 10 cm slice from the end of each packet and transfer it with the aid of sterile spoon to glass stoppered bottle which has been previously sterilized.

f) Scale of sampling

i) Lot A) All the units in a single consignment belonging to the same batch of manufacture grouped together to constitute a lot. If a consignment is declared to consist of different batches of manufacture, the batches marked separately and the group of units in each batch shall constitute separate lots.

ii) If the butter is supplied in bulk units like in casks or boxes, the number of units to be selected for sampling depend on the size of the lot and shall be in accordance with the table given below :

iii) Number of bulk units to be selected for sampling :

Number of bulk units in the lot	Number of units to be selected
1	1
2 to 9	2
10 to 49	3
50 to 99	4
100 to 199	5
Over 200	5 for the first 200 & 1 each for 200 additional units thereof.

8.3.3 DETERMINATION OF MOISTURE

a) Apparatus

i) Flat bottom moisture dish of stainless steel/aluminum having 7 - 8 cm diameter and 2.5 cm depth.
ii) Dessicator
iii) Spirit lamp/electric hot plate
iv) Tong

b) Procedure

i) Weigh accurately about 10 gm.of well mixed sample into dry dish, which has been previously weighed.

ii) Heat the dish over spirit lamp/hot plate with constant circular motion.

iii) Continue the heating of the sample until the foaming has ceased and the curd at the bottom of dish has attained brown color.

iv) Cool in a dessicator.

v) Weigh the dish and preserve it for curd and salt determination.

c) Precautions

While heating the dish, precautions are to be observed that there must not be under heating , which is indicated by whitish yellow color. On the other hand, dark brown/black curd indicates over heating.

d) Calculations

$$\text{Moisture \% by wt.} = \frac{W1 - W2}{W1 - W} \times 100$$

Where
W = Wt. gms.of the empty dish
W1 = Wt.in gms.of dish with butter sample.
W2 = Wt.in gms.of dish after heating,

8.3.4 DETERMINATION OF CURD

a) Reagents

I) Petroleum ether 40 - 60 deg.C range

ii) Filter paper whatman No.1

b) Procedure

i) Melt the residue and add 25-50 ml petroleum ether.

ii) Decant carefully all the fatty acid solution from dish leaving the sediment in the dish.

iii) Wash the sediment twice with 20-25 ml petroleum ether.

iv) Decant again the fatty acid solution .

v) Dry filter paper containing residue in the oven at 100 deg.C + 1 deg.C. for 30 mts.and cool in a dessicator.

vi) Repeat the cooling and drying until the loss of wt. between two consecutive weighing does not exceed 0.1mg.

vii) Preserve the residue for salt determination.

c) Calculations

$$\text{Curd + salt \%age by wt.} = \frac{W1 - W2}{W} \times 100$$

Where
W = Wt.in gm.of sample.
W1 = Wt.in gm.of the filter paper with residue
W2 = Wt.in gms.of filter paper without residue.

Note : Curd (% age by wt.) is obtained by subtraction of the value of salt (% age by weight).

8.3.5 DETERMINATION OF SALT

(A) Method One

a) Reagents

i) Potassium Chromate indicator 5% (W/V) in water.

ii) Standard 0.1N silver nitrate solution.

b) Procedure

i) Transfer the contents of dish into 250-ml volumetric flask.

ii) Wash the dish 3 - 4 times with hot distilled water, transfer it to volumetric flask and make up the volume to 250 ml.

iii) Pipette out 25 ml. of the solution into a beaker and add 2 ml. of potassium chromate indicator.

iv) Titrate against 0.1N silver nitrate solution until brown color appears.

v) Brownish color must persist for 30 seconds.

vi) Note the ml.of 0.1N AgNO3 used in titration.

$$\% \text{ Nacl by Wt.} = \frac{58.5 \times V}{W} \text{ gms of Nacl}$$

c) Determination of fat

Calculation

Fat % by wt. =100- [Moisture %) + Curd % + salt (%)]

(B) Salt Estimation by direct titration method (Method Two)

After melting the butter by adding boiling water, the chlorides in the mixture are titrated with a solution of silver nitrate using potassium chromate as indicator.

a) Reagents

i) Silver nitrate solution 0.1N

ii) Potassium chromate solution 5% (W/V) in distilled water.

b) Procedure

i) Preparation of sample

Soften sample in a closed sample container by warming in water bath kept at as low temp. as practicable in order to break emulsion. Temp. of 23 deg.C is often suitable for this purpose, but in case the temp.exceeds 29 deg. C, shake sample container at frequent intervals during softening process to thoroughly mix sample. Remove sample container from water bath and shake vigorously at frequent intervals until sample has cooled to a thick creamy consistency.

ii) Weigh accurately 5 gm.of sample into a conical flask

iii) Carefully add 100 ml.of boiling distilled water. Allow it to stand for 5 to 10 mts.swirling occasionally while cooling to 50 - 55 deg.C (Titration temp.)

iv) Add 2 ml of Potassium Chromate solution and mix well.

v) Add about 0.25 gm.of calcium carbonate

vi) While mixing continuously, titrate with the silver nitrate solution (0.1N) until the color changes to orange brown and persists for 30 sec.

c) Calculation
Salt (% by wt.) = (0.585 X V) / W

Where
V = ml.of 0.1N AgNO3 used in titration.
W = Wt.of butter sample taken.

8.3.6 FAT CONTENT DETERMINATION

(A) Method One

a) Reagents

I) Sulphuric acid, density 1.50 mg/ml at 15.5 deg.C.

ii) Amyl Alcohol, density 0.814 to 0.816 at 15.5 deg.C.

b) Procedure

i) Mix well the butter sample in a porcelain dish.

ii) Weigh 5 gm.of butter in the cup of butyrometer, and replace the cup in butyrometer.

iii) Through the upper (narrow) opening of butyrometer, fill in 10 ml. of sulphuric acid and 1 ml.of amyl alcohol.

iv) Close the opening with a stopper and shake until all proteins are dissolved.

v) If the contents in the butyrometer does not reach the 70% mark, add sulphuric acid to reach the mark.

vi) Place the butyrometer in water bath at temp.of 50-55 deg.C for 4-5 mts.to enable the melting and separation of fat.

vii) Centrifuge for 3 - 4 mts.

viii) Take the butyrometer from centrifuge and place it in water bath maintained at 65 deg C. for 5 mts.

ix) Take the butyrometer from water bath and read the %age of fat.

(B) Method Second

a) Reagent

Petroleum ether (boiling point 40 - 60 deg.C)

b) Procedure

i) Weigh 10 gms.of butter into previously dried flat bottom dish.

ii) Place the dish on hot plate to remove moisture until curd particles turn brownish.

iii) Cool the dish in a dessicator

iv) Add to this dish 20 – 50 ml.of petroleum ether and mix well.

v) Filter the solution. If decanted, care must be taken to avoid disturbance to sediments.

vi) Collect the filtrate in a 250 ml. flat bottom flask.

vii) Wash all the fat and sediment from the dish with 20 - 25 ml.of petroleum ether and finally wash the filter paper with petroleum ether until it is free from fat.

viii) Collect all the filtrate in the flask.

ix) Evaporate the petroleum solvent containing the ex tracted fat on the hot plate.

x) Dry the flask containing the fat in an oven (100 +/- 1 deg.C) for 1 Hr.

xi) Cool in a dessicator and weigh.

c) Calculations

$$\text{Fat \% by wt.is} = \frac{100\,(W1 - W2)}{W3}$$

Where
W1 = Weight in gm.of 250 ml flask with dried flask.
W2 = Weight in gms.of empty flask.
W3 = Weight in gms.of sample.

8.3.7 DETERMINATION OF ACIDITY

a) Reagents

I) Standard 0.1N NaOH solution

ii) Phenolphthalein Indicator (0.5%)

b) Procedure

i) Weigh accurately about 10 gms.of sample in a conical flask.

ii) Add 50 ml.of hot distilled water and shake the contents.

iii) While hot, titrate it against 0.1N NaOH solution using 1 ml.of phenolphthalein indicator.

c) Calculations

Titratable acidity as % by wt. = (9 X N X V) / W

Where
N = Normality of NaOH sol.
V = Volume in ml.of NaOH used for titration.
W = Wt.of sample in gms.

8.4 GHEE (BUTTER FAT)

8.4.1 SAMPLING

All the sampling equipment and containers must be perfectly clean, dry and free from any foreign odor or flavor. Sample must be protected from light and heat and to be kept in a cool place.

A sample which is representative of the bulk is essential and is particularly difficult to obtain from a consignment consisting of a large number of packages. It is recommended that the method given must be adhered to wherever practicable. The number of containers to be selected for sampling shall depend upon the size and shall be as follows. Number of containers to be selected for sampling

Number of containers in the lot	Number of containers to be selected
1	1
2 to 40	2
41 to 110	3
111 to 300	5
301 to 600	7
600 and above	10

The containers shall be selected at random from the lot.

8.4.2 ORGANOLEPTIC EVALUATIONS

a) Score card for Ghee

Flavor	- 50
Texture	- 20
Color	- 10
Free from suspended impurities	- 15
Package	- 5
Total	100

b) Grading

Score	**Grade**
91 or above	Excellent
80 to 90	V. Good
70 to 79	Good

8.4.3 MOISTURE

a) Apparatus

Moisture dish of aluminum, 7-8 cm in diameter and 2 to 2-5 cm.deep provided with tight fitting slip overcover.

i) Dessicator :- Containing an efficient Dessicant.
ii) Air oven :- Preferably electrically heated with temp control device.

b) Procedure

i) Weigh accurately about 10 gm. of ghee in well cleaned preweighed dish.

ii) Place the dish in an electric oven at 100 +/- 1 deg.C for 3 hours.

iii) Transfer the dish to dessicator for cooling it to room temp.and weigh.

iv) Note the loss in weight.

v) Repeat the heating for half an hour each time until the difference between the two successive weighing does not exceed 1 mg.

c) Calculations

$$\text{Moisture by wt.} = \frac{x1 - y}{x1 - x} \times 100$$

Where x = Wt.in gm.of empty dish
x1 = Wt.in gm.of dish with ghee
y = Wt.in gm.of dish after drying.

8.4.4 DETERMINATION OF FREE FATTY ACIDS

a) Reagents

i) Ethyl Alcohol - 95% (V/V) sp. gravity 0.8160
ii) Standard N/10 NaOH
iii) Phenolphthalein indicator (1%) in 95% (V/V) ethyl alcohol.

b) Procedure

i) Weigh accurately 10 gms.of ghee into a clean conical flask.

ii) Add to it 50 ml.of alcohol which is earlier neutralized and having temp. approx. 70 deg.C.

iii) Mix the contents thoroughly. Heat the flask to boiling point.

iv) Titrate against 0.1N NaOH while the contents are still hot,shaking vigorously during titration until a faint pink color persists at least for 15 seconds.

c) Calculations :

$$\% \text{ Free Fatty acid as oleic acid} = \frac{2.82 \times TV}{W}$$

Where TV = ml.of 0.1 N NaOH required for titration.
W = Wt.of ghee sample in gms.

8.4.5 DETERMINATION OF BUTYRO-REFRACTOMETER READING.

a) Apparatus

Butyro-refractometer apparatus is also used to check the adulteration of ghee.

b) Procedure

i) Calibrate the apparatus with standard solution of known B.R. reading (43.5 at 40 deg. C.).

ii) Place 3- 4 drops of melted filtered ghee on the lower surface of the prism.

iii) Close the prism firmly, maintain the temperature around the prism at 40 deg. C. by circulation of hot water.

iv) Adjust the border line so that it falls on the point of intersection of cross line.

v) Read the B.R. reading on the scale.

c) Inference

i) B.R. reading of pure ghee ranges from 40 - 43. In case, value does not fall in this range, it indicates that ghee is adulterated.

8.4.7 DETERMINATION OF REICHERT MEISSEL (RM) AND POLENSKE VALUE (PV)

a) **DETERMINATION OF R.M.VALUE**

b) Apparatus

i) Graduated cylinder - 100 ml. and 25 ml capacities.

ii) Pipette 50 ml.

iii) Flat bottom boiling polenske flask made up of heat resistant glass and shall conform to the following details

c) Steal Head

d) Condenser

i) Receiver - The receiver to be a flask with two graduation mark on the neck, one at 100 ml and the other at 110 ml.

ii) Asbestos board - An asbestos board of 120 mm diameter and 6 mm in thickness with a circular hole about 65 mm in diameter must to be used to support the flask over the burner.

iii) Gas burner - The burner must be sufficient large to allow the distillation to be completed in the specified time.

iv) Glass funnel of approx. diameter 6 Cm.

e) Reagents

i) Glycerol 98% (W/W), AR
ii) Sodium Hydroxide - 50% (W/W)
iii) Dilute Sulphuric Acid: 25 ml. of conc. H2SO4 is diluted to 1:1 and adjusted until 40 ml. neutralize 2 ml.of 50% NaOH solution.
iv) Glass beads - Approx. size 1.5 to 2.00 mm diameter.
v) Phenolphthalein indicator - 0.5% solution in 95%
vi) (V/W)in ethyl alcohol.
vii) Sodium Hydroxide - 0.1 N
viii) Filter paper - Whatmann No. 4 of 9 cm diameter.

f) Procedure

i) Weigh accurately 5.0 +/- 0.01 gm.of ghee sample in a polensky flask.

ii) Add 20 gm.of glycerol and 2 ml. of 50% NaOH.

iii) Heat the flask over the naked flame with continuous mixing till ghee is saponified and ghee becomes perfectly clear. Avoid over heating during saponification. Cover the flask with glass.

iv) Measure 93 ml. of boiling distilled water which has been vigorously boiled for 15 mts. Add this when the soap is sufficiently cooled. (If the solution is not clear, indicate incomplete saponification or darker than light yellow indicate over heating. In this case repeat saponification.)

v) Add few beads followed by 50 ml. of dil. H2SO4. Connect the flask at once with distillation apparatus.

vi) Heat the flask without boiling its contents, until insoluble acids are completely melted.

vii) Now increase the flame and distill 110 ml. in between 19 to 21 minutes.

viii) Keep the water flowing in the condenser at a sufficient speed to maintain the temp.of issuing distillate between 18 to 21 deg.C.

ix) When the distillate reaches the 110 ml. mark, remove the flame and replace the 110 ml. flask by a cylinder of about 25 ml.capacity to catch draining.

x) Close 110 ml. flask with its stopper and without mixing the content, place it in water at 15 deg.C. for 10 mts. so as to immerse the 110 ml. mark.

xi) Remove the flask from the water, dry from outside and invert the flask carefully avoiding wetting the stopper with insoluble acids.

xii) Filter through whatman no. 4. Reject the first running and collect 100 ml.in a dry volumetric flask. Cork the Flask and retain the filtrate for titration.

xiii) For R.M.Value

Take 100 ml filtrate, add 1 ml. of phenolphthalein Indicator. Titrate against 0.1 N NaOH solution and note down the reading as V ml.

xiv) Determination of Polenske Value.

1) Detach the still head and wash the condensor with three successive 15 ml. of cold distilled water, passing each washing separately through the cylinder, the 110 ml flask, the filter and the funnel, nearly filling the paper each time and draining the each washing before filtering the next. Discard the washing.

2) Dissolve the insoluble acids by 3 similar washing of the condensor, the cylinder and the filter with 15 ml. of neutralized ethanol, collecting the solution in the 110 ml. flask and draining the ethanol filter each washing.

3) Titrate this ethanol solution against 0.1 N NaOH using phenolphthalein as indicator.

4) Note the reading in ml. (V2). Carry out blank test without ghee but using the same quantities of reagents and following the same procedure.

G) Calculations

i) R.M.value = 1.10 (V - V1)
Where V = ml.of 0.1 N NaOH used for sample.
V1 = ml.of 0.1 N NaOH used for blank test.

ii) P.V. (V2 - V1)
Where V2 = ml.of 0.1 N NaOH used for sample.
V1 = ml.of 0.1 N NaOH used for blank test.

8.4.8 DETECTION OF VEGETABLE OILS (Seasame oil)

(BAUDOUIN TEST)

a) Reagents

i) Hydrochloric acid - sp. gravity 1.19
ii) Furfural solution : 2% solution of furfural, distilled not earlier than 24 hours prior to test, in rectified spirit.

b) Procedure

i) Take 5 ml. melted ghee in a test tube provided with glass stopper.

ii) Add 5 ml. of Hydrocholoric Acid.

iii) Add 0.4 ml. of furfural solution.

iv) Insert the glass stopper and shake vigorously for 2 mts.

v) Allow the mixture to separate.

vi) Pink color in acid layer indicates seasame oil mixed with the sample.

8.4.9 MINERAL OIL TEST

Preparation of Alcoholic KOH solution.

1. Take 16 gms of KOH in a glass beaker and dissolve in 16 ml distilled water.

2. Transfer the contents into a 500 ml measuring flask and wash the beaker with ethyl alcohol (98%) solution into the measuring flask. Make up volume with Ethyl Alcohol (95%) solution.

3. Take 2 gm of Ghee sample in a conical flask. Add 44 ml ofAlcoholic KOH solution.

4. Attach the condenser and sponify the mixture on hotplate heater for 10 minutes.

5. Transfer the contents into 100 ml.test tube and add 50 ml of hot distilled water. If turbidity appears, mineral oil present in a given sample of ghee.

8.4.10 DETERMINATION OF PEROXIDE VALUE OF GHEE

A) Chemical Required :

1. Glacial Acetic Acid.
2. Chloroform.
3. Saturated Potassium Iodide solution.
4. N/100 Sodium Thiosulphate Solution.
5. Acetic Acid : Chloroform Mixture (3:2)
6. Starch Indicator (1 %)

B) Procedure :

1. Take 5 gm (approximately) ghee sample in a conical flask
2. Add 30 ml mixture of Acetic Acid & Chloroform.
3. Swril & add 0.5 ml of saturated Pottasium Iodide Solution.
4. Allow to Stand for exactly one minute with occasional shaking.
5. Add 30 ml of distilled water.
6. Titrate against N/100 Sodium Thiosulphate solution using starch as indicator.
7. Perform the blank test in same way.

Calculations

$$\text{Peroxide Value} = \frac{(A - B) \times N \times 1000}{\text{Wt. of sample}}$$

Where :
A → For value of Sodium Thiosulphate used in titration.
B → For volume of Sodium Thiosulphate used in Blank titration.
N → Normality of Thiosulphate solution.

8.4.11 DETERMINATION OF DEXTROSE EQUIVELENT IN MALTO DEXTRIN/GLUCOSE.

A) Chemical required

1. Fehling A and Fehling B.
2. Methylene blue indicator (0.2 %).
3. Standard Dextrose solution (0.6 %)

a) Weigh accurately 3 gms of Dextrose anhydrous (previously heated to 101 degree 'C' for three hours & cool to room temperature)

b) Dissolve in 100 ml distilled water & make up the final volume to 500 ml.

B) Standardization of Fehling's solution

1. Take 5 ml. of each Fehling A & Fehling B in a conical flask.
2. Add 5 ml. of distilled water & place the flask on heater.
3. Add in small quantities (1 ml. at a time) standard Dextrose solution till red color appears.
4. Add 1 ml. of 0.2 % Methylene blue indicator.
5. Again add standard Dextrose solution dropwise till blue color of indicator disappears.
6. Note the volume of standard Dextrose solution used.

   Factor = 2.5 x 100 x V 1

C) Procedure :

1. Take approximately 10 gm. of sample.
2. Dissolve it in distilled water & make up the final volume to 500 ml.
3. Titrate above solution against Fehling's solution using Methylene blue indicator.

4. Note the volume used to complete the titration.

Calculation : - D. E = $\frac{\text{Factor x 100}}{\text{T.S x Wt. x Titre value}}$

8.4.12 DETERMINATION OF IODINE IN IDOPHOR

1. Take 5 ml of sample in a conical flask.
2. Add 10 ml of distilled water and 1 ml of glacial Acetic Acid.
3. Add slowly N/10 Sodium Thiosulphate solution till light yellow color persists.
4. Add 1 ml of freshly prepared Starch solution .(1 %)
5. Again add N/100 thiosulphate solution till blue color disappears.

Iodine PPM, = Titre value x 20 x 127

8.5 STERILISED MILK

8.5.1 DETERMINATION OF CREAMING INDEX

Procedure

1. Take 50 ml of the sample in three centrifugal tubes graduated from 0 to 50 ml.
2. Centrifuge for 15 minutes at 1000 rpm/minute.
3. Pipette out 5 ml from each test tubes from top layer into a dry beaker (Sample- I).
4. Then empty the three tubes into a separate container. (Sample - II).
5. Perform the FAT test of Sample I & II.

$$\text{Creaming Index} = \frac{\text{A-B X 100}}{\text{B}}$$

A is Fat content of Sample I
B is Fat content of Sample II

If creamy Index is less than 10, it indicates that milk has been homogenised properly.

8.5.2 DETRMINATION OF FAT

Same procedure as explained at 8.1.13.

8.5.3 DETRMINATION OF TOTAL SOLIDS

Similar procedure as indicated at 8.1.18.

8.5.4 DETERMINATION OF SUCROSE

CHEMICALS :

1. FEHLING 'A' - As in case of Lactose determination.
2. FEHLING 'B' - As in case of Lactose determination.
3. METHYLENE BLUE INDICATOR - do -
4. Stock Solution of Invert Sugar

   Weigh accurately 23.75 gm of dried sucrose in a breaker. Dissolve in 100 ml distilled water and transfer carefully into a 1000 ml graduated flask. Wash the beaker with distilled water into 1 Ltr. flask. Add 10 ml of conc. HCL and keep at 20 o C for three days. Make up the volume to 1 ltr

5. Standard Invert Sugar Solution

   Take 50 ml of stock solution. Make just neutral to litmus paper by IN NaOH and make up the volume to 500 ml.

6. Neutral lead acetate solution

   Dissolve 41 gm of lead acetate in 100 ml. distilled water and neutralize to litmus paper using IN NaoH or dilute acetic acid.

7. Pottasium oxalate solution

Prepare saturated solution of potassium oxalate.

Procedure

1. Take 10 ml of sample in a 250 ml conical flask. Add 100 ml water and heat upto 40 - 50 degree C.

2. Add neutral lead acetate solution dropwise (rotating the flask) till complete precipitation. Allow to stand for one minute.

3. Check for complete precipitation by adding small quantity of lead acetate solution.

4. Add just sufficient quantity of pottassium oxalate solution to precipitate excess of lead.

5. Filter into a 250 ml volumeteric flask. Wash the precipitates with hot water into volumeteric flask and make up the volume.(Solution C)

6. Carry out titration of fehling's solution against solution C.

$$\text{O.R.S.} = \frac{25 \times \text{Factor}}{\frac{V1 \; W}{W \; W}}$$

Where V1 = Titre value

W = Wt of sample

Factor = 2.5X Titre Value in titration ofstandard invert sugar solution & Fehling's solution.

7. Take 50 ml of solution C in a 250 ml graduated flask. Add 25ml of water and 10 ml 6.34 N HCl.
8. Immerse the flask in hot water bath at 70 Degree C for about 7 minutes.

9. Cool immediately to 20 Degree C by immersing the flask in water bath at 20 Degree C for 5 to 7 minutes

10. Make just neutral to litmus paper by IN NaOH and make up the volume to 250 ml at 20 Degree C.

11. Carry out titration with fehling's solution.

$$T.R.S. = \frac{25 \times 5 \times Factor}{V\ 2\ W}$$

Where V 2 - Titre Value
W - Wt of sample

Factor = 2.5 X Titre Valuein titration of standard invert sugar solution and fehling's solution.

$$\% \text{ Sucrose} = (T.R.S. - O.R.S) \times 0.95$$

8.6 PANEER

8.6.1 PHYSICAL PARAMETERS

i) Appearance : Paneer must be clear and free from dirt, surface discolouration, insects and rodent contamination and from adultrants. It must not have any free moisture.

ii) Flavour : It is to have a pleasant odour and characteristic mild acidic flavour.

iii) Texture : Paneer is to have a closely knit smooth texture, firm, cohesive and spongy body.

8.6.2 DETERMINATION OF MOISTURE

a) Apparatus :

i) Flat bottom moisture dish with lid.
ii) Drying oven – maintained at 102 +/- 1 deg.C
iii) Dessicator

b) Procedure

i) Weigh accurately about 2 gm. Of grated paneer sample into a clear previously dried and weigh dish.

ii) Add 4 ml.of hot distilled water and mix with glass rod.

iii) Wash-off the particles of material adhering to the glass rod by pouring an additional 1 ml. of hot distilled water.

iv) Transfer the dish after uncovering into electric oven maintained at 102 +/- 1 deg.C for 3 to 4 hours.

v) Cool the dish in the efficient dessicator.

vi) Weigh the dish with the lid on. Repeat the process of drying, cooling and weighing at 30 minutes intervals until the difference between the two consecutive weighments is less than one mg.

c) Calculation.

$$\text{Moisture \%} = \frac{100\,(M1 - M2)}{M1 - M}$$

Where

M1 = Mass in gm.of the dish with material before drying.
M2 = Mass in gm. of dish with the material after drying.
M = Mass in gm.of empty dish.

8.6.3 DETERMINATION OF FAT

A) Fat estimation by extraction method

a) Apparatus :

Same as in case of estimation of fat of Milk by Mazonnier Method

b) Procedure

i) Weigh accurately about 1 gm.of sample into a clean 50 ml. beaker.

ii) Add 8 ml.of hot distilled water.

iii) Add 3 ml.of ammonia solution

iv) Warm and swirl gently the mixture till the paneer is dissolved completely. Cool the mixture.

v) Transfer the contents in the Majonnier fat extraction tube with 10 ml.of ethyl alcohol. Mix well.

vi) Rest procedure is same as in case of estimation of fat by Mazonnier tube.

B) Fat Estimation by Gerber Method

a) Procedure

i) Weigh accurately 3 gms. of Paneer in a 100 ml. Beaker.

ii) Add 10 ml hot water in it and mix thoroughly.

iii) Transfer the contents into a cheese butyrometer having 10 ml sulphuric acid in it.

iv) Remove the residual content by adding 2 - 3 ml of Hot water.

v) Add 1 ml Amyl Alcohol & mix the contents.

vi) Certifuge the contents for 3 mts.

vii) Dip the butyrometer in water bath at 65 deg. C. for 3 mts.

viii) Read the Fat% on butyrometer scale.

8.6.4 DETERMINATION OF TITRABLE ACIDITY

a) Apparatus

i) Burette
ii) 100 ml. beaker
iii) Pipettes to deliver 10 ml and 1 ml
iv) Pestle and mortar

b) Reagents

i) 0.1 N NaOH (standard)
ii) Phenolphthalein indicator (0.5%)
iii) 0.1 N HCl (standard)

c) Procedure

i) Weigh accurately about 2 gm.of paneer into a beaker.

ii) Add 3 ml.of boiling distilled water.

iv) Render the sample into a fine paste using a pestle and mortar.

v) Dilute by another 17 ml.of boiling distilled water washing off the adhedherants from the pestle.

vi) Cool it to room temprature.

vii) Add 10 ml.of 0.1 N NaOH

viii) Add 1 ml.of phenolphthalein indicator.

ix) Titrate against 0.1 HCl till pink color disappears, stir vigorously throughout.

d) Calculations

Titrable acidity (as Lactic acid)

$$\% \text{ by mass} = \frac{10 - V}{M} \times 0.9$$

Where

V = Volume of 0.1 N HCl used in titration.
M = Mass in gm.of sample of paneer.

8.7 LASSI

8.7.1 ACIDITY

a) Reagents

N/10 NaoH, Phenolpthaline indicator (1%).

Sample Preparation :- Contents of the pouch are transferred to a beaker & mixed thoroughly to form a smooth solution.

b) Procedure

i) Weigh 10 gms. of the sample in a 100 ml beaker.

ii) Add 25 ml. distilled water and mix thoroughly & heat the solution to near boiling.

iii) Add 1 ml phenolpthaline indicator solution.

iv) Titrate with O.IN NaoH solution to a light pink end point.

c) Calculation

Acidity = Volume of N/10 NaOH used x 0.09

8.7.2 FAT (GERBER METHOD)

a) Apparatus - Milk bytrometer, centrifuge (Gerber)

b) Reagents

i) Gerber acid, (Sulphuric Acid 1.82 Spf.gravity)
ii) Amyl alcohol.

c) Procedure

i) Weigh accurately 10 g. Lassi in dry & clean conical flask.

ii) Add 90 ml distilled water to it and mix thoroughly.

iii) Add 5 ml ammonia solution to it and mix thoroughly to make homogenous solution.

iv) Transfer 10.75 ml.sample to milk butyrometer having 10 ml. sulpuric acid.

v) Add 1 ml. Amyl alcohol.

vi) Mix contents thoroughly and centrifuge for 3 - 5 mts.

vii) Fat % is directly read on the butyrometer scale

d) Calculation

Fat % of Lassi = % fat observed (1+dilution factor)
= % fat (1+1/10)

8.7.3 TOTAL SOLIDS

a) Apparatus :- Aluminum dishes (with cover) : water bath, drying oven, dessicator, weighing balance.

b) Procedure

i) Take 5 g of sample in a preweighed Aluminum dish (dish heated at 100 deg. for 1 hr. & cooled in desicator).

ii) Place the dish over a boiling water bath with continuous stirring for 30 min.

iii) Transfer the dish to the drying oven maintained at 100 _+2 deg. C. for 3 - 4 hours.

iv) Remove to the dissector for cooling & weigh.

c) Calculation

Wt.of empty dish = x gms.
Wt. of dish + sample = y gms.
Wt. of sample = (y - x)gms.
Final wt. of sample + dish = z gms.
Wt. of sample after drying = (z - x) gms.

$$\% \text{ moisture} = \frac{z - x}{y - x} \times 100$$

% Total Solids = 100 - moisture %

8.8 MILK CAKE

8.8.1 FAT

a) Apparatus :- Cheese butyrometer,centrifuge machine.

b) Reagents :-Sulphuric acid, ammonia solution, Amyl alcohol.

c) Procedure

i) Take 10 ml. sulphuric acid in cheese butyrometer.

ii) Pour 1 ml. of water over the sulphuric acid.

iii) Weigh accurately 3 g. of grated milk cake in butyrometer directly.

iv) Add 1 ml. Amyl Alcohol & mix the contents.

v) Centifuge the contents for 3 - 5 mts.

vi) Read % Fat on butyrometer scale.

8.8.2 TOTAL SOLIDS (GRAVIMETRIC)

a) Apparatus

Aluminum dish (3" dia & 1" deep), dessicator, water bath, drying oven, weighing balance.

b) Procedure

i) Take a pre weighed aluminum dish (dish heated at 100 + 1 deg. for 1 hr. & cooled in dessicator)

ii) Add 3 gm. of the grated paneer & again weigh the dish.

iii) Spread out the product on the dish.

iv) Transfer the dish to the oven maintained at 100 + 1 deg.C. for 3 - 4 hrs.

v) After drying, remove the dish to the dessicator for cooling and take final weight.

c) Calculation

Wt. of empty dish = x gms.
Wt. of dish + sample = y gms.
Wt. after drying = z gms.
Wt. of dry product = (z-x) gms.
% Moisture = $\frac{(z-x)}{(y-x)} \times 100$

% TS = 100 - Moisture %

8.9 PINNI

8.9.1 FAT

a) Apparatus :- Butyrometer,centrifuge machine.

b) Reagents :-Sulphuric acid, Amyl alcohol.

c) Procedure

i) Take 10 ml. sulphuric acid in butyrometer.

ii) Pour 1 ml. of water over the sulphuric acid.

iii) Weigh accurately 1 g. of properly mixed & grated pinni in butyrometer.

iv) Add 1 ml. Amyl Alcohol & mix the contents.

v) Centifuge the contents for 3 - 5 mts.

vi) Read butyrometer reading.

(D) Calculation : % Fat = 11.25 X Butyrometer Reading

8.9.2 TOTAL SOLIDS (GRAVIMETRIC)

a) Apparatus

Aluminum dish (3" dia & 1" deep),dessicator, water bath, drying oven, weighing balance.

b) Procedure

i) Take a pre weighed aluminum dish (dish heated at 100 + 1 deg. for 1 hr. & cooled in dessicator)

ii) Add 3 gm. of the grated pinni and again weigh.

iii) Spread out the product on the dish.

iv) Transfer the dish to the oven maintained at 100 + 1 deg.C. for 3 - 4 hrs.

v) After drying, remove the dish to the dessicator for cooling and take final weight.

c) Calculation

Wt. Of empty dish = x gms.
Wt. Of dish + sample = y gms.
Wt. After drying = z gms.
Wt. Of dry product = (z-x) gms.
% Moisture = $\frac{(z-x)}{(y-x)} \times 100$
% TS = 100 - Moisture %

8.10 STERILIZED FLAVOURED MILK

8.10.1 DETERMINATION OF TOTAL SOLIDS BY GRAVIMETRIC METHOD.

a) Apparatus

Shallow flat bottom dishes of aluminum alloy/ nickel/ stainless steel having 7 to 8 cm. diameter & about 1.5 cm. in height and provided with easily removable but closely fitting lids, water bath, drying oven, dessicator, weighing balance.

b) Procedure

i) Weigh accurately the clean dry empty dish with lid.

ii) Pipette into dish about 5ml of milk sample & weigh accurately with the lid on.

iii) Place the dish uncovered on a boiling water bath at least for 30 minutes .

iv) Remove the dish from water bath, wipe the bottom & keep the dish in the hot air oven over a silica triangle maintained at 98 to 100 deg C placing the lid by the side of the dish.

v) After 3 hours, cover the dish & immediately transfer to a dessicator

vi) Allow to cool for 15 to 20 minutes (Approx.)

vii) Weigh the dish along with lid.

viii) Return the dish uncovered & the lid to the oven & heat for one hour.

ix) Remove to the dessicator, cool & weigh as before. Repeat if necessary until the loss of weight between successive weighing does not exceed 0.5 mg. Note the lowest reading.

c) Calculations

$$\text{Total solids \% by wt.} = \frac{100 \times W1}{W2}$$

Where
W1= Weight in gms of the residue after drying
W2= Weight in gms of sample

8.10.2 DETERMINATION OF FAT
GERBER METHOD

a) Apparatus

i) Milk Butyrometer (ISI)
ii) Gerber Centrifuge
iii) Hot water bath maintained at 65 deg.C.
iv) Automatic measure for H2SO4/Tilt Measure
v) Milk Pipette (10.75 ml)
vi) Automatic measure for Amyl Alcohol.

b) Reagents

i) Sulphuric acid - It should have a density of 1.807 to 1.812 gm/ml.at 27 deg.C corresponding with a concentration of sulphuric acid from 90 - 92% by mass. Color shall be colorless or not darker than pale amber in color.

ii) ISO Amyl Alcohol - Amyl Alcohol should be colorless, distilled between 128 deg.C to 132 deg.C, density 0.8030 to 0.8050 gm/ml at 27 deg.C.

c) Procedure

i) Take 10 ml.of sulphuric acid with the help of tilt measure into well cleaned butyrometer.

ii) Pipette out 10.75 ml.of the well mixed milk sample which is previously heated to 40 deg. C. & then cooled to 27 deg. C. and transfer it to the butyrometer without allowing it to mix with acid.

iii) Add 1 ml. of Amyl Alcohol

iv) Tighten the stopper and mix the contents by shaking the butyrometer at 65 deg.C till the curd has been dissolved.

v) Place the butyrometer in the centrifuge machine and balance the machine and centrifuge for 3-4 minutes at full speed.

vi) After centrifugation, transfer the butyrometer in water bath at 65 deg.C +/- 2 deg.C for 5 minutes.

vii) Take the accurate reading after adjusting fat column.

8.10.3 ALCOHOL TEST

a) General

The alcohol test is used for rapid assessment of stability of milk for processing, particularly for condensing and sterilization. The alcohol test is useful as an indication of mineral balance of milk and not so much as an index of developed acidity.

b) Apparatus

Test tubes - 15.0 X 19 mm

c) Reagents

70% rectified alcohol by volume (density 0.8675 gm./ml at 27 deg.C

d) Procedure

i) Take 5 ml of milk in a test tube.
ii) Add 5 ml of alcohol (70%).
iii) Mix the contents of the test tube by inverting few times.
iv) Note any flakes and clot.
v) The presence of a flakes or clot denotes a positive test.

e) Inference

A negative test indicate low acidity and good heat stability of the milk. Milk showing positive test is not considered suitable for the he manufacture of sterilized milk.

8.10.4 DETERMINATION OF SNF USING LACTOMETER.

a) Apparatus

i) Lactometer (ISI).
ii) Lactometer Jar.
iii) Thermometer(standard)

b) Procedure

i) Dilute the sample 50 % ,add 100 ml. water to 100 ml. milk sample.

ii) Warm the milk sample at 40 deg. C. & maintain at this temp. for 3-5 minutes.

iii) Mix the contents by inverting the sample bottle upside down and vice versa by taking care to avoid the formation of bubbles foam.

iv) Cool the sample approximately to the temperature at which the lactometer reading is required to be taken.

v) Insert lactometer gently to wet the stem and allow the lactometer to remain steady in milk. Take the reading within 30 seconds. Note the reading of the lactometer corresponding to the top meniscus on the stand without the error and parallax.

vi) Note the Temperature of milk

vii) Obtain the correct lactometer reading by applying approx. correction factor.

c) Formulas

1) %SNF = CLR /4 + 0.2 X F + 0.29
where CLR=corrected lactometer reading at 15.5 deg. C

2) % SNF = CLR/4 + 0.25 F +0.50
where CLR = corrected lactometer reading at 27 Deg.C (ISI lactometer)

8.10.5 ORGANOLEPTIC EVALUATIONS

a) Score card for S.F.M.

Taste/Flavor	-	50
Color	-	25
Sediments	-	20
Package	-	5
Total		100

b) Grading

Score	**Grade**
91 or above	Excellent
80 to 90	V. Good
70 to 79	Good
60 to 69	Not good

8.11 CURD

8.11.1 ACIDITY

a) Reagents

N/10 NaoH, Phenolpthaline indicator (1%).

Sample Preparation :- Contents of the pouch are transferred to a beaker & mixed thoroughly to form a smooth solution.

b) Procedure

i) Weigh 10 g of the sample in a 100 ml beaker.

ii) Add 25 ml. distilled water and mix thoroughly & heat the solution to near boiling.

iii) Add 1 ml phenolpthaline indicator solution.

iv) Titrate with O.IN NaOH solution to a light pink end point.

c) Calculation

Acidity = Volume of N/10 NaOH used x 0.09

8.11.2 ORGANOLEPTIC EVALUATIONS

a) Score card for Curd

Taste / Flavor	-	50
Texture	-	20
Color	-	10
Free from suspended impurities	-	15
Package	-	5
Total		100

b) Grading

Score	**Grade**
90 or above	Excellent
80 to 90	V. Good
70 to 79	Good

8.12 ANALYSIS OF ICE CREAM

8.12.1 DETERMINATION OF ACIDITY

1. Take 10 g of ice-cream mix in a clean beaker.
2. Add 10 ml of distilled water.
3. Add 1 ml of phenolphthalein indicator(0.5%)
4. Titrate against standardized o.I N sodium hydroxide solution till Pink color appears.
5. Note down the volume of sodium hydroxide solution used.

Acidity % = Volume used X 0.09.

8.12.2 DETERMINATION OF FAT PERCENTAGE IN ICE-CREAM MIX

1. Take 10 ml of sulphuric acid (90-92%) in a clean butyrometer.
2. Pour 2 g (approximately) of ice-cream mix by sides of the butyrometer.
3. Make up the volume by water upto desired level.
4. Add 1 ml. of amyl alcohol.
5. Put the lock stopper and mix well.
6. Centrifuge the butyrometer for 3 to 4 minutes. Read the fat column.

$$\text{Fat \% in Ice Cream} = \frac{\text{Fat in butyrometer X 11.25}}{\text{Wt. of Sample}}$$

8.12.3 TOTAL SOLIDS

1. Heat the aluminum dish along with cover to 100 degree C in oven for 30 Mts. and cool down to room temperature in a dessicator.
2. Take initial weight of dish along with cover.

3. Weigh approximately 3 g of sample in dish. (Carry out the test in duplicate).

4. Dry the sample in dish on boiling water bath for 30 Mts.

5. Transfer the dish alongwith cover to hot air oven (maintained at 100-degree +/- 2° C) for 3-4 hours.

6. Cover the dish with its cover and transfer to dessicator and cool down for 10-15 minutes.

7. Take final Wt. of the dish alongwith cover.

$$\% \text{ TS} = \frac{C - A}{B} \times 100$$

where C - Final wt. of dish after dry
A - Wt. of Empty dish
B - Wt. of Sample

8.12.4 PROTEIN PERCENTAGE

1. Take 5 g of ice-cream mix in a beaker.

2. Add 10 ml of distilled water.

3. Add 0.4 ml of saturated potassium oxalate solution.

4. Wait for 2 minutes and observe the intensity of pink color. (Add sodium hydroxide solution dropwise if pink color does not appear).

5. Add 2 ml. of neutralized formaldehyde solution

6. Titrate against standardized N/10 sodium hydroxide solution till pink color of same intensity appears.

Protein % = Volume of NaOH used X 19.55

8.12.5 SACCARIN TEST

i) Take approximately 25-ml milk sample in a beaker.

ii) Heat to 70 degree C and coagulate with 10% citric acid solution.

iii) Filter the solution and take 2 ml. of filtrate in a test tube.

iv) Add 2 ml of Ammonium molebdate solution (10%).

v) Add 2 ml of concentrate Hydrochloric Acid.

vi) Mix well and place on boiling water bath for exactly 2 minutes.

Inference - If blue or green color appears, saccharin is present.

8.13 MICROBIOLOGICAL EXAMINATION OF MILK & MILK PRODUCTS.

8.13.1 SAMPLING EQUIPMENT

a) Equipment

Sampling equipment is to be made of stainless steel, or of other suitable material of adequate strength, which does not bring about a change in the sample, which could affect the results of subsequent examinations.

b) Sterilization of Equipment.

Sampling equipment to be thoroughly cleaned and sterilized by following methods.

i) Exposure to steam at 121 + deg.C. for not less than 20 minutes in an autoclave. (The equipment must be dry when used)

ii) Exposure to hot air at 180 to 185° C. for not less than 1.30 hour.

If in a particular situation, sterilization by above methods is impossible; the following alternative methods are to be used.

iii) Exposure to saturated steam at 100 deg. C. for 1 hour.

iv) Immersion in boiling water for at least 1 minute.

v) Immersion in 70 % (v/v) ethanol solution and ignition to burn off the ethanol.

c) Sampling Technique

The precise method of sampling a mass or volume of product to be taken varies with the nature of the product & the purpose for which samples are required. Using a sterilized spoon, knife or spatula, remove the surface layer of the product from the sampling area to a depth of 10 mm with a sterilized instrument, take a sample of not less than 100 g if possible from near the center of container. Transfer the sample as quickly as possible into the sterile sample container, which is to be immediately closed, taking aseptic precautions; place the container immediately in the refrigerator.

d) Sample Size

PRODUCT	**MINIMUM SAMPLE TO BE DRAWN**
1. SMP	100 gm. to 200 gm.
2. WMP	100 gm. to 200 gm.
3. Dairy Whitener	100 gm. to 200 gm.
4. Butter	100 gm. to 200 gm.
5. 1 kg Packing SMP	50 gm sample after every 1 hour
6. Indigenous Products	50 gm from each batch.

e) Frequency

i) SMP Premium grade or extra grade After every 50 bags

ii) SMP (a) General grade After every 100 bags
(b) PremiumGrade ---do----

iii) WMP All types of grade After every 50 bags

iv) DAIRY Whitener All type of grade After every 100 bags

.

8.13.2 METHYLENE BLUE REDUCTION TEST

b) Apparatus

a) Sterile test tubes without rim (150 X 16 mm) with marking at 10 ml. (Test tubes are sterilized in Hot oven maintained at 180 degree C. for 1.30 hrs.
b) Water bath maintained at 37 +/-0.5 deg. C.
c) Sterilized rubber bung.
d) Graduated 10 ml. & 1 ml pipette.

c) Reagents – Methylene Blue solution.

A standard solution of Methylene Blue is prepared by dissolving one tablet of Methylene Blue thiocynate in 200-ml sterile distilled water. Allow the mixture to stand for several hours to facilitate complete solution & then adding 600 ml. of sterile glass distilled water. One ml. of solution mixed with 10 ml. of milk results in obtaining a final concentration of 1/30,0,00 for the dye, which has been found satisfactory.

d) Procedure

i) Take 10 ml. of properly mixed milk sample into the test tube. Replace the sterile bung using sterile forceps.

ii) Add 1 ml. of dye solution to milk aseptically in the test tube. Replace the sterile bung using sterile forceps.

iii) Mix the dye & milk by inverting the test tube twice.

iv) Place the test tube in water bath maintained at 37 deg. C.

v) Observe the test tubes after every 30 Mts. and if there is no sign of decolorisation, tubes are inverted once & returned to water bath. If the decolorisation has commenced, the tubes must not be disturbed.

vi) Continue the observation until complete reduction of dye occurs or the formation of persistent blue ring (0.5 mm) at the top.

vii) Two control tubes containing 10 ml. of milk and dye solution after heating it in the boiling water for 3 minutes and another with 10 ml. milk and 1 ml of tap water also kept in water bath. These tubes are required for comparing the change in the experimental tubes.

e) Inference

The following MBR times are suggested as a guide for grading pasteurized milk supplies.

MBR Time (Hours)	Quality of Milk
above 6	Very good
5 to 6	Good
4 to 5	Fair
below 4	Poor

8.13.3 STANDARD PLATE COUNT (LIQUID MILK)

a) Apparatus

i) Incubator maintained at 37 deg. C.
ii) Bacteriological pipette (1.1 ml. and 2.2 ml)
iii) Dilution test tubes.
iv) Dilution bottles marked at 99 ml.
v) Petridishes (100 mm x 91 mm x 15 mm)

c) Reagents

I) Media

Standard Plate Agar (MO91) or Tryptose Glucose yeast Extract Agar (M014).

ii) Diluent

a) Use phosphate buffer or quarter strength of ringer's solution.

Stock phosphate buffer

Dissolve 34 GMS of KH2PO4 in 500 ml. water, adjust pH 7.2 by 1 NaOH & make up volume 1 lt. and keep it under refrigeration. For dilution blank, take 1000 ml. of distilled water and add 1.25 ml of stock phosphate buffer solution and mix well.

b) Ringer Solution

Stock Solution

Sodium chloride	9.0 GMs.
Potassium chloride	0.42 GMs.
CaCL2 Calcium chloride	0.48 GMs.
Sodium Bicarbonate	0.2 GMs.
Distilled water	1.0 lt.

Working solution

Take 250 ml. of stock solution and make it 1 lt. by distilled water and use it suitably to prepare dilution bottles and tubes.

c) Normal Saline solution :- 9.2 gm. of sodium chloride in 1000 ml. of glass distilled water

d) Procedure

i) Mix the sample several times by up and down movements.

ii) Pipette 1 ml. to first diluent tube.

iii) Rotate the tube between the palms of the hand for complete mixing. This makes dilution (1:10)

iv) Transfer 1 ml. of the first dilution into another 9-ml dilution tube to get 1:100 dilution and similarly 1 : 1000 dilution and so on according to requirement.

v) Now transfer 1 ml. of each required dilution into sterile petridishes in duplicate.

vi) Allow almost 3 seconds for the pipette to drain and touch the tip of the pipette to a dry place in the petridish to drain out last drop.

vii) To each plate add 10 to 15 ml of media which is previously melted and cooled to 45 deg. C.

viii) Mix the contents of the plate by gentle rotation and allow the agar to cool and set.

ix) Invert the plates and incubate at 37 deg. C. for 48 hours.

x) After 48 hours incubation, select the pair of plates having colonies between 30 to 300 Nos.

xi) Count the number of colonies with the help of colony counter and take average count of the two plates.

xii) Express the result as standard plate count (SPC) /ml. of sample.

e) Interpretation

8.13.4 TEST FOR COLIFORM ORGANISMS

b) Apparatus

a) Same as for standard plate count
b) Both tubes with Durhams fermentation tubes.

c) Media

List of common media used for presumptive test and confirmatory test.

i) Presumptive Test -a) Liquid Media - Trypose laural sulphate/ Macconkey broth.

b) Violet red bile agar(Solid Media)

ii) Confirmatory Test : Brilliant green broth (2%).

d) Procedure (Liquid Media)

i) Prepare serial dilution of the sample. The choice of dilution depends upon the type of sample that is to be tested.

ii) Transfer 1 ml of second dilution (1:100) for raw milk and in case of pasteurized milk, transfer first dilution (1:10) into liquid milk media in triplicate.

iii) Mix the contents of the tubes so that there should be no air bubble.

iv) Incubate at 37 deg. C. for 48 hrs.

e) Observations

a) Observe for gas formation in Durham's tube

b) Acid and gas formation in at least 2 tubes out of 3 tubes is indicative of the +VE presumptive test.

8.13.5 SANITATION OF EQUIPMENT AND CONTAINERS

ASSESSING STERILITY OF MILK BOTTLES_

a) Material

i) Sterilized plate counts agar.
ii) Sterilized petridishes.
iii) Sterilized 1 and 10 ml.pipettes.
iv) Sterile ringer's solution or phosphate buffer or saline solution .
v) Sample of washed bottles closed with sterile rubber bungs.

b) Procedure

i) Add 20-ml saline or buffer solution to the bottle & replace the bung. The same amount of solution can be used for rinsing bottles of different sizes.

ii) Hold the bottle horizontally in the hands, rotate gently 12 times in one direction & also shake length wise 12 times so as to wet whole of the internal surface thoroughly.

iii) Transfer 1 ml. & 5 ml portions of the rinse solution to two set of petridishes Pour medium into the plates allow the medium to set & incubate the plates at 37 deg + 0.5 deg. C. for 48 hrs.

iv) At the end of 48 hrs., count the number of colonies selecting those plates showing colonies between 30 to 300.

v) The average of counts in duplicate plates multiplied by 20 gives the colony count/ bottle.

vi) Report the results in terms of colony count per bottle.

c) Interpretation

Colony count of more than one colony /ml. of the capacity of the bottle is an indication of unsatisfactory sterility.

Capacity of Bottle	Colony counts/Bottle
250 ml.	250 and below Satisfactory
500 ml.	More than 250 Not Satisfactory 500 and below Satisfactory More than 500 Not Satisfactory.

8.13.6 ASSESSING STERILITY OF MILK CANS

A) Material

a) Sterilized Plate Count Agar medium.
b) Sterilized petridishes.
c) Sterilized 1 & 10 ml pipettes.
d) Sterile normal saline or phosphate buffer solution (500ml)

c) Procedure

i) Make a visual inspection of each can and note the presence of any dents, open seams, poor lids, rusty spots on the interior surface, moisture, dirt and film, scale of milk solids.

ii) Pour 500 ml of sterile saline solution or buffer solution into the can. If the can is sterilized by chlorine treatment, it is necessary to incorporate sodium thiosulphate into the ringer solution to give a concentration of 0.5% .

iii) Replace the lid, lay the can on its side & roll it to and fro so that it makes 12 complete revolutions.

iv) Pour the rinse sample from the can into a sterile bottle or flask.

v) The rinse sample to be examined immediately other wise it must be placed in a refrigerator and examined not later than 24 hrs.

vi) Invert the container slowly three times to mix the rinse samples.

vii) Transfer 1 ml. of sample into duplicate plates.

viii) Prepare 1/10 dilution of sample using 9 ml of dilution blank and transfer 1 ml. of the dilution into another set of plates.

ix) Pour agar media into plates & after media is set, incubate the plates at 37 $\pm$ 0.5 deg. C. for 48 hrs.

x) After the incubation period, remove the plates and count the colonies. Plates having colonies from 30 to 300 must be used for counting.

xi) The average of the counts in duplicate plates represents the colony count per ml of rinse sample.

INFERENCE :-

Express the results in terms of colony count /ml.

Colony count per Litter capacity	Sterility
Less than 500	Satisfactory
500 to 1000	Fairly satisfactory
More than 1000	Unsatisfactory.

8.13.7 ASSESSING STERILITY OF PLANT AND EQUIPMENT BY SWAB METHOD

a) Material

i) Plate Count Agar Media (M091) [Hi-media]
ii) Sterilized petridishes.
iii) Sterilized 1.0 & 10 ml. pipettes.
iv) Test tube containing 25 ml of saline solution or phosphate buffer solution.
v) Swab consisting of cottons wool or wire gauze.

b) Preparation Of Swab

The swab consisting of cotton wool or wire gauge wound around the end of a metal wire (35 cm long x 2.6 mm diameter), formed into a loop at one end leaving a straight length of 30 cm. & notched at the other end to hold the gauge or cotton wool (non-absorbent), The cotton wool or gauge secured with a thread. Place the swab in 40 ml of the normal saline containing sodium thiosulphate (1%) in test tube, plug with cotton wool & sterilize by autoclaving at 121 deg.C. for 15 minutes.

c) Procedure

i) Press the swab with a rolling motion against the side of the glass tube to remove the excess liquid & take it out of the tube.

ii) Rub the swab with heavy pressure back & forth over the area to be examined so that all parts of the surface are treated twice. The swab must be rotated so that all parts of it make contact with surfaces. The swabbing should be repeated over a spot of 10 X 5-cm area in different parts of the surface so that the total area covered comes to 900 sq. Cm. wherever possible. To facilitate swabbing over required areas, thin metallic mask (12.5 x 7.5 cm.) with a cut out - area of 10-x 5 cm. in the center, may be sterilized & used.

iii) After rubbing the required area, return the swab to the solution in the tube in which it was originally placed.

iv) Allow the swab to be immersed in the liquid for 5 minute & mix by swirling the swab vigorously in the solution six times. Remove the swab after pressing the excess liquid by pressing against the side of test tube.

v) Mix the swab sample thoroughly by rotating the tube between the palms of the hands.

vi) Prepare 1/10 dilution of the sample using a 9-ml dilution blank.

vii) Transfer 1-ml portion of the swab sample as well as the 1/10 dilution into duplicate plates & add melted Plate Count Agar media.

viii) Incubate the plates at 37 deg. C. for 48 hrs.

ix) At the end of the incubation period, count the plates having 30 to 300 colonies & find the colony count / ml. of the swab sample. This number multiplied by 40 gives the colony count of the total area swabbed from which the count /900 sq.cm. area can be calculated.

x) Express the results as colony count / 900 sq. cm area of surface of equipment.

d) Inference

Colony count/900sq.cm. area	Sterility
< 5000	Satisfactory
5000 to 25000	Fairly satisfactory
> 25000	Unsatisfactory.

8.13.8 PREPARATION OF STOCK SOLUTIONS

a) PHOSPHATE - BUFFERED STOCK (CONCENTRATE SOLUTION)

i) Dissolve 34 grams of potassium dihydrogen phosphate (KH2PO4) in 500 ml. of distilled water.

ii) Adjust pH to 7.2 with 1 N NaOH and make upto one litter with distilled water.

iii) To prepare dilution blanks, take 1.25 ml. Of stock solution per litter of distilled water.

iv) Dispense into bottles to produce 99-ml portions.

v) Autoclave at 121 deg. C. for 15 minutes.

b) 10 % Tartaric Acid Solution

To prepare Tartaric acid solution for inhibition of bacteria on Potato Dextrose Agar :

i) Dissolve 10.0 g of tartaric Acid crystals in 90 ml of distilled water. Autoclave at 121 deg. C for 15 minutes.

ii) Add this solution at 10-ml/ liter sterile Potato Dextrose Agar medium (PDA) immediately before plating. Gently swirls flask.

c) Preparation of Normal Saline Solution

i) Dissolve 9.2 gm. of sodium chloride (LR grade) in 1ltr. distilled water

ii) Dispense 100 ml into dilution bottles to prepare 99-ml blanks.

iii) Auto clave at 121 deg. C. for 15 minutes.

8.13.9 STANDARD PLATE COUNT (AEROBIC PLATE COUNT)

a) Apparatus and material

i) Dilution bottles
ii) Pipettes (2.2 ml)
iii) Petridishes
iv) Normal Saline solution.
v) Plate count Agar (M091A)
vi) Potato dextrose Agar (M096)/Tryptose glucose Agar
vii) Tartaric acid (10%) - sterilize.

b) Procedure

i) Aseptically weigh 11 g of sample into a sterile dilution bottle containing 99 ml. of sterile phosphate buffered diluent or normal saline.

ii) Blend for approximately 2 minute or until sample is well mixed. (some samples will not require the use of a blender). These can be shaken through a one-foot excursion for 25 times.) This provides a 1:10 dilution.

iii) Prepare serial dilutions by pipetting 1 ml into 9 ml of sterile diluent in dilution tubes. These prepared dilutions to be plated within 15 minutes.

iv) Select suitable dilutions to yield plates with 30 - 300 colonies.

v) Pipette 1-ml aliquots in duplicate for at least two consecutive dilutions.

vi) Pour molten agar (held at 45 dec.) into plates. Swirl to disperse the sample throughout the media.

vii) Allow to cool.

viii) After cooling, invert the plates and incubate for 48 hours at 37 deg.C.

8.13.10 YEAST AND MOULD COUNT

a) Procedure

i) Aseptically weigh 11 g of sample into 99 ml. of sterile saline solution.

ii) Shake for approximately 2 minutes for complete mixing.

iii) Prepare decimal dilutions to provide counts of 30 to 300 colonies per plate.

iv) Transfer 1.0 ml aliquots to petri plates. Prepare duplicate plates.

v) Immediately prior to pouring, molten Potato Dextrose Agar (PDA), adjust pH to 3.5 by acidifying with 1 ml. (tartaric acid(10%) per 100 ml of PDA, gently swirl to mix.

vi) Pour plates and mixes thoroughly by gently swirling.
(Note : Elapsed time from preparation of dilutions to pouring of plates should not exceed 15 minutes)

vii) Allow to cool and solidify.

viii) Invert/ and incubate at 25 deg.C for 3 - 5 days. Count after 5 days unless mould is likely to overgrow the plates.

ix) Count plates containing 30 to 300 colonies using a colony counter.

x) Report the average of the duplicate plates multiplied by the dilution factor.

8.13.11 DETERMINATION OF TOTAL BACTERIAL SPORES

a) Apparatus & Reagents

i) Autoclave
ii) Petridishes
iii) Pipettes (2.2 ml.)
iv) Incubator
v) Dilution blanks and test tubes
vi) Plate count Agar (M 091 A)/Tryptone glucose yeast extract Agar.

b) Procedure

i) Add aseptically 1 ml. of test sample to a sterilized petridishes in duplicate.

ii) Pour approx. 12-15 ml. of media aseptically into petridishes which has been previously melted in boiling water bath and cool to 45 deg. C.

iii) Rotate the dishes without splashing over edge.

iv) Allow to solidify.

v) Invert the dishes and incubate at 55°C deg separately.

vi) Count the colonies after 48 hours.

c) Interpretation

Spores count should not be more than 5 per ml.

8.13.12 PROCEDURE FOR ENUMERATION OF STAPHYLOCOCCUS AUREUS (Coagulase Positive)

a) Reagents

i) Baird Parker media (M043).
ii) Brain Heart infusion (Hi-media)
iii) Coagulase (Difco)

b) Introduction

Two methods are described here for the measurement of S.aureus present in a food sample. The two methods are

Direct plate count - for samples believed to have >100 S.aureus/gram.

c) Direct Plate count Method

i) Aseptically weigh 11 gram sample into 99 ml of sterile saline solution.

ii) Mix sample approximately for 2 minutes.

i) iii) Take 1.0 ml of diluted sample and put in Baird Parker Media plate previously soldified and dried in oven at 55 degree C for 15 minutes. Perform this test in triplicate.(0.4,0.3 & 0.3 ml.)

iii) Using a sterile bent glass rod, spread the sample over the surface of the media.

iv) Incubate for 24-48 hrs. at 37 deg.C.

ii) vi) Examine the plates for typical staphylococcus colonies.

vii) On baird parker plates, they would appear grey or jet black frequently with a light colored margin surrounded by an opaque zone .

viii) Colonies which do not appear to be typical of those described above should be gram stained (Staphylococci will appear as gram positive which grow in irregular grape - like clusters).

ix) Transfer typical colonies to Brain Heart Infusion broth. Be sure to keep records of which plate each colony is from.

x) Incubate for 18 -24 hrs at 37deg. C. The time of this incubation is critical since healthy, young cells are required for the following step.

xi) Coagulase tube test : Run as per difco instructions allowing 24 hours for the entire test.

xii) Those tubes, which are positive, should be traced back to the plates from which they were originally taken. Counts of all typical colonies from coagulase positive plates should be made a total from all three plates obtained. By multiplying the count by the dilution factor, the total count/gram is obtained.

8.13.13 PROCEDURE FOR ENUMERATION OF SALMONELLA AND SHIGELLA

a) Reagents

i) De-oxycholate citrate agar.
ii) Selenite F-both (MO52A)
iii) Tetra thionate broth base (MO32)
iv) XLD Agar (MO31)
v) Brilliant green agar (M971)
vi) Bismuth sulphite Agar (MM027)
vii) Triple sugar Iron Agar (M021)
viii) Macconkey agar (M082)
ix) Sulphite indole motility agar (Hi-media 181)
x) Simmon's citric Agar (99)

b) Pre-Enrichment

i) Aspectically weight 50 g of skimmed milk powder (for Premium quality customers) and 25 whole milk powder (ISI) into sterile 450/200 ml of distilled water.

ii) For those foods with high fat content, add 13.5 ml (6 ml./ 100 ml broth) of sterile tergitol -7 solution.

iii) Mix for approximately 2 minutes.

iv) Incubate for 24 hours at 37 deg.

c) Enrichment

i) Pipette 1 ml of pre-enrichment solution into each of the following :

a) 10 ml selenite - F broth
b) 10 ml tetrathionate broth

ii) Swirl to dispense throughout the broth.
iii) Incubate for 18- 24 hrs. at 37 deg. C.
iv) Mix A & B broth in a sterile container.

d) Isolation

i) Streak one loopful of broth into each of the following media (Note :- The surface of these plates must be absolutely dry otherwise discrete colonies can not be obtained.)

A. Deoxycholate citrate Agar
B. XLD Agar
C. Brilliant Green Agar
D. Bismuth Sulfite Agar

ii) Incubate these plates for 48 hours at 37 deg. C

e) Biochemical Test.

Transfer Typical Salmonella & Shigella colonies to TSI agar slants using a stab to the butt of the agar media tube and streaking the surface of the slant. Transfer only one colony to each tube. All plates may not yield well-isolated, typical colonies so be sure to identify which plate suspected colonies are taken.

Typical Salmonella colonies

i) Brilliant Green Agar:- Colorless, pink to fuschia, translucent to opaque, with surrounding medium pink to red. Some will appear as transparent green colonies if surrounded by organisms fermenting lactose or sucrose. Less than 1% of the Salmonella are typical in that they ferment lactose and appear as yellow green colonies.

ii) Bismuth Sulfite Agar: - Brown, black colonies sometimes with metallic sheen surrounding media are usually brown and darkens to black with time.

iii) XLD:- Salmonella will appear pink or pink with black centers.

iv) Incubate TSI tubes for 18-25 Hrs.at 37 deg.C.

a) Observed reactions should include

1) Slant Acid or alkaline
2) Butt acid or alkaline
3) Gas formation
4) H2S formation

f) Biochemical Test

Testing to be continued on colonies exhibiting the following in TSI

Alk = Red Acid = Yellow

	1	2	3
Slant	Alk.	Alk.	Alk
Butt	Acid	Acid	Acid
Gas	0	0	+
H2S	0	+	+

Typical Shigella colonies

a) Bismuth Sulphite Agar(BSA) :- Poor growth observed in this medium,but brown colored colonies is seen.

b) Mac-Conkey Agar colorless , transparent colonies

c) XLD agar red colored colonies are seen

d) Deoxycholate Citrate Agar (DCA- Colorless colonies seen after 24 hrs.but become pale to pink after 48 hrs.

e) Incubate at 35 deg. C for 5 days.

f) Check tubes daily.

g) Salmonella will cause a strong alkaline reaction producing purple coloring throughout the tube. A negative test is a permanent yellow color.

h) A positive xlysine decarboxylase test (preceded by the other tests) can be interpreted as a probable posi tive.

g) OBSERVATIONS:

The colonial appearance of salmonella & shigella is as given below:-

S.NO.	Medium	Salmonella	Shigella
a)	Bismuth Sulphate Agar (BSA)	Black Colonies with a metallic sheen	Poor growth Brown colonies
b)	Macconkey Agar	Colorless, transparent Colonies	Colorless, transparent colonies
c)	Deoxycholate Citrate Agar (DCA)	Transparent colonies with a bluish cast or large & opaque processing black Center	Colorless after 24 hrs. colonies becoming pale to pink on 48 hours
d)	Xy-lose lysine Deoxychloate Agar (XLD)	Red colonies with black center	Good growth, colonies are red

If in any of the plates colonies of above description are observed, proceed for biochemical testing as follow :

h) Biochemical testing

For performing the biochemical tests, inoculate Different media as follows :-

i) Sulphite Indole Motility test.
Inoculate in stab of SIM Medium (Hi-Media codeNo. 181) with an inoculating needle.

ii) Tripple sugar iron agar test.
Stab and streak a slant of the TSI Agar (Hi-Media Code No. 21)

iii) Citrate utilisation test
Lightly streak a slant of Simmon's citrate Agar (Hi Media code No. 99)

iv) Urea Test
Heavily inoculate a slant of Christensen's urea agar at 37 degree C and observe after 18 hrs. The characteristics of different organisms is given.

1	2	3
ORGANISM	SIM	TSI
Salmonella	No change in color Diffuse growth H2S produced(Black color developed).No Indole production on addition ofkovac's reagent	of slant & butt yellow. H2S production .
Shigella	No diffuse growth (Nonmotile). No H2S produced.No Indole production	Slant Red Butt Yellow Gas not produced. H2S not produced

4	5	6
SIMMONS CIRATE AGAR	UREA TEST	INDOLE TEST
Fair to good growth Blue/blue green color of green color of medium.	Luxrient growth.No change in color	Indole not produced on addition of kavac's regent.
Inhibited growth (Greenish color of media if growth is there)	No change in color	- do -

8.13.14 PROCEDURE FOR ISOLATION & IDENTIFICATION OF BACILLUS CEREUS DETECTION AND ENUMERATION

a) Reagents

i) B. Cereus Agar (M833),PH-7.3 to 7.5
ii) Glucose
iii) Nitrate test medium

b) Procedure

i) Weigh 11 gm sample and add to 99 ml. Sterile dilution blank

ii) Inoculate 1 ml. of this dilution by distributing 0.4,0.3 and 0.3 ml portions into three B. cereus Agar Plates. Spread the dilution over media evenly with the help of bended rod (Agar must be dried properly before inoculation).

iii) Incubate plates for 24 hrs. at 37 degree C and observe for colonies surrounded by precipitate zone. B. cereus colonies are peacock blue in color, which becomes more intense after additional incubation. If reaction is not clear, incubate plates for additional 24 hrs. at room temperature before counting colonies.

iv) Count colonies that are typical of B. cereus in all the three plates. Add up and multiply by 10 (the dilution factor). Express results as B. cereus/g.

v) Whenever additional or specific information is required, the following bio-chemical tests can be performed.

vi) Grams Stain Test

B. cereus is Gram positive rod with square ends, in short to long chain.

c) Carbohydrate Fermentation Test

Incorporate glucose to the Carbohydrate fermentation test medium. The final concentration of the carbohydrate in medium is to be 1%. Inoculate the strain into the glucose tube and incubate at 37 degree C for 24 hrs. Bacillus cereus ferments glucose with Production of acid but no gas.

d) Nitrate Test.

Inoculate the strain into Nitrate Test Medium & incubate at 37 degree C. overnight . Add 0.5 to 1.0 ml sulphanillic acid solution and then add napthaline solution. After adding the reagents to the overnight culture, shake to observe the development of a distinct red or pink color, which indicates a positive nitrate reduction test. B. cereus give positive test.

8.13.15 BACTERIOLOGY OF WATER

a) Material

i) Sterilized glass stoppered bottle.
ii) Methylated spirit or ethyl alchol.
iii) Dilution blank (9 ml.saline)
iv) Voilet Red Bile Agar
v) Sterilized dishes & 2.2 ml bacteriological pipettes.

b) Procedure

i) Allow the water to run for two to three minutes.

ii) Clean inside & outside of the nozzle of the tap.

iii) Sterilize the nozzle of the tape by heating it with a Bunsen lamp or a piece of ignited cotton wool soaked in Methylated spirit or alcohol.

iv) Allow again the water to run slowly for about a minute.

v) Hold the sample in one hand near the tap. Remove the stopper with the other hand. Flame the mouth of the bottle quickly bring the bottle below the running stream of water & when the bottle is nearly full, tap it out & quickly replace the stopper.

vi) The above observations must be carried out quickly to prevent undue exposure of the bottle to atmospheric contamination & to avoid any water falling on the outside of the mouth from dripping inside.

vii) Shake the water sample thoroughly by moving the bottle up and down 25 times.

viii) Prepare 2 serial dilutions 1 in 10 ml. and 1 in 100 ml. using the dilution blanks. Mix the dilution thoroughly by rotating tubes between palms.

ix) Place twelve petridishes on the table, six for each series of one set at 37 degree C. and another at 22 deg. C.

x) Transfer 1 ml. of sample directly from the bottle (zero dilution), 1 ml from dilution 1 (1/10) and 1 ml from dilution 2 (1/100) into three separate petridishes (in duplicate). Mark the dilutions: 0, 1 and 2 on the respective plates.

xi) Let agar cool to 45 deg. C. pour into the plates & mix the agar with the inoculation by gently rotating the plates without allowing the agar to flow out.

xi) When the agar has set, pour another layer of agar and allow it to dry.Invert the plates & incubate one series at 37 deg. C. for 48 hrs. & the other at 22 deg C. for 72 hrs.

x) At the end of the incubation period, count the plates containing 30 to 300 colonies. In case of the zero dilution, the number of colonies may be counted even if it is less than 30.

xi) Calculate the number of organism per ml of water.

xii) Record your observations and interpret the results.

Sample source	Dilution	Bacterial Count at Deg. C	Average Bacterial count at	Total Balance Bacterial count at deg C	Ratio of count at deg C	Remarks
1. 2. 3.		37 : 22	37 : 22	37 : 22	37 : 22	

8.13.16 CULTURE PROPAGATION AND MAINTENANCE

Lyphoilized culture from ampule
[Lassi Curd – strain – BD – 4, Yoghurt :- YH – 3]

↓

Inoculate in 20 ml of sterilized reconstituted skim milk

↓

[MOTHER CULTURE]
(To be activated after every one month)

↓

Inoculate 2 ml of mother culture in 200 ml of sterilized milk (in Duplicate)
[STOCK CULTURE]
(To be activated after every 15 days)

↓

Inoculate 2 ml of stock culture in 200 ml of sterilized Skim Milk (In duplicate)
(To be activated after 7 days)
[1st INTER MEDIATE]

↓

Inoculate 2 ml of 1st intermediate in 200 ml of sterilized Skim Milk
(To be activated after 7 days)
[2nd INTERMEDIATE]

↓

Inoculate 2 ml of 2nd intermediate in 200 ml of sterilized Skim Milk
(To be activated every days)
[3rd INTERMEDIATE]

Inoculate 2 ml of 2nd intermediate in 100 ml of sterilized Skim Milk to prepare bulk culture
[BULK CULTURE]

Note :- Acidity & activity of the bulk culture to be checked daily.

8.13.17 PREPARATION OF STARTER CULTURE
STARTER ACTIVITY TEST

During the continued propagation of starter cultures, The cultures are likely to become week and lose their Activity & viability due to contamination by undesirable micro-organisms, change in composition of media & other causes. It is therefore, necessary to test periodically the activity of the culture. This is judged by observing the rate of acid production by the organisms, their ability to reduce Methylene blue added to milk, and their ability to form volatile flavor compounds (diacetyl) in milk.

A) ACTIVITY TEST

a) MATERIAL

i) Starter culture for Dahi & Lassi.
ii) Stock Skim Milk (10 ml in test tubes)
iii) 1 Ml. Graduated pipettes
iv) 0.1 N sodium hydroxide solution.
v) Burette.
vi) 1 % phenolphthalein in solution.

b) Procedure

i) Mix the culture thoroughly and transfer 0.3 ml to 10 ml. of sterilized Skim Milk.

ii) Incubate the tube at 37 degree C. for 3.30 hours.

iii) Transfer the entire contents using 5 ml distilled water into a 100 ml. Conical flask & add a few drops of phenolphthalein indicator.

iv) Titrate against 0.1 N NaOH solution.

v) Record the observation & culture acidity in terms of percentage lactic acid.

c) Inference

Acidity of 0.65% or more indicates that culture is satisfactory.

B) Dye Reduction Test

Material

a. Starter culture
b. Sterile Skim Milk tubes
c. Sterilized Methylene blue dye.
d. Sterile 10.0 & 1.0 ml pipettes.
e. Sterilized rubber bungs and forceps.
f. Clock, watch or an internal timer

a) Procedure

i) Mix the culture thoroughly and transfer 1 ml to 10 ml of sterile skim milk. Mix the contents well.

ii) Add 1 ml of Methylene blue solution to the test tube & replace cotton plugs with rubber bungs using sterile forceps.

iii) Note the time of decolouration.

b) Inference

The quality of the culture is judged on the basis of the time taken for reduction of Methylene blue as follow :-

Reduction Time	**Grade**
Less than 35 Mts.	Very Good
Between 35 to 50 Mts.	Satisfactory
More than 1 hr.	Poor

8.14 ANALYSIS OF CHEMICALS

8.14.1 DETERMINATION OF % PURITY OF SODIUM HYDROXIDE AND SODIUM CARBONATE IN A DETERGENT SOLUTION

a) Apparatus

a) Pipette (10 ml)
b) Burette graduated (25 ml)
c) Conical flask

b) Reagent

i) N/10 standard H2SO4 or HCl
ii) Phenolpnthalein Indicator (0.5%)
iii) Methyl orange indicator (0.5%)

c) Procedure

i) Pipette out 10 ml of detergent solution into a conical flask.

ii) Add few drops of phenolpnthalein indicator.

iii) Slowly add standard 0.1N H2SO4 or HCl from burette while mixing the contents of the conical flask.

iv) Note down the volume of acid required to change the pink color to colorless (A ml.)

v) Now add 1-2 drops of methyl orange indicator

vi) Again titrate with acid till yellow color just changes to light orange.

vii) Note the volume of acid used in this titration (B) ml.

d) Calculation

If only phenolphthalein is used, it gives the volume of acid required to neutralize all sodium hydroxide and half of sodium carbonate present in the test sample. Further titration using methyl orange indicator gives the volume of acid used for the other half of the sodium carbonate present in the sample.

i) For Sodium hydroxide

Vol. of acid required to neutralize all NaOH = (A - B)
Where A = ml.of acid used in first titration.
B = ml.of acid used in second titration.

% age Purity of NaOH = 0.04 (A - B)

ii) For Sodium Carbonate

Volume of acid used to neutralize all Na2CO3 in given mixture = 2 X B

%age of Na2CO3 = 0.106 B

c) Total alkalinity

0.04 (A - B) + 0.106 B
0.04 A + 0.066 B

8.14.2 DETERMINATION OF AVAILABLE CHLORINE IN CHLORINE STERILIZER SOLUTION.

a) Apparatus

i) Conical flask 250 ml.
ii) Burette (25 ml)
iii) Pipe
iv) Beaker

b) Reagent

i) Standard 0.1 N sodium thiosulphate solution.
ii) N/10 glacial acetic acid
iii) Potassium iodide (LR)
iv) Starch Indicator (1%)

d) Procedure

i) Measure 50 ml of Chlorine solution drawn from the CIP tank.

ii) Add 2 g potassium iodide crystal to the solution and dissolve & followed by 1 ml of glacial acetic acid.

iii) Immediately titrate the mixture against N/10 sodium thiosulphate until the brown color changes to light straw yellow.

iv) Immediately add 1 ml of 1% freshly prepared starch solution.

v) Titrate it with 0.1 N sodium thiosulphate solution till the color disappears.

vi) Note the reading of 0.1N Sodium Thiosulphate used in the titration. Let it be V.

vii) Make the blank determination using the same reagent and deduct from V ml.

e) Calculation

PPM of available Chlorine = V X 70

8.14.3 DETERMINATION OF FREE CHLORINE IN WATER USED IN DAIRY PLANT.

a) Apparatus :- Conical flask - 250 ml.

b) Reagent :- Chlorotex.

c) Procedure

i) Measure 5 ml of Chlorine reagent in a measuring cylinder.

ii) Add to it rapidly 50 ml.of water sample .

iii) Mix thoroughly.

iv) Allow to stand for 1 minute.

v) Observe the color of solution.

d) Inference

	Color produced	Chlorine in PPM	Indication
1.	White milky florescent	Nil	) Insufficient
2.	Light Pink	0.1	)
3.	Pink	0.2	)
4.	Red	0.5	) Suitable for use
5.	Purple (light)	0.6	)
6.	Violet	0.8	) Too much Chlorine present
7.	Blue	1.0	)

8.14.4 ESTIMATION OF TOTAL HARDNESS OF WATER.

a) Apparatus

i) Conical flask 250 ml
ii) Graduated pipette

b) Reagents

i) EDTA N/50 - dissolve 3.72 GMS EDTA in 1000 ml. distilled water.

ii) Ammonia buffer solution - dissolve 17.5 g of ammonium chloride in small quantity of water. Add to it 142 ml of Ammonium Hydroxide and make up volume to 250 ml. and adjust the pH to 10.0.

iii) Eriochrome black T indicator - 10% (aqueous)

c) Procedure

i) Take 50 ml.sample in a conical flask

ii) Add 1 ml. of ammonia buffer solution.

iii) Add few drops of indicator

iv) Titrate with N/50 EDTA solution until solution in the flask has lost all traces of red color. The final color at the end point is usually blue or grey.

d) Calculation

= 20 X V

Where V is ml of N/50 EDTA used in the titration

8.14.5 ESTIMATION OF PURITY OF FORMALDEHYDE SOLUTION

a) Description

A colorless liquid, with characteristic pungent and irritating odor. A slight white cloudy deposit is formed on long standing, especially at low temps. due to the separation of paraformaldehyde. This deposit disappears on warming the solution.

ISI Requirements

i)	Acidity as HCOOH% by mass (Max.)	- 0.05%
ii)	Aldehyde content as (HCOOH) % by mass (Max.)	- 37 +/- 0.5
iii)	Ash % by mass (Max.)	- 0.01
iv)	Iron (as Fe), PPM (Max.)	- 2
v)	Methanol content % by mass (Max.)	- 4 to 6

b) Identification

i) Dilute 2 ml. sample with 10 ml. water in a test tube and add 1.0 ml.of solution of silver ammonium nitrate.Mettalic silver is produced either in the form of a finely divided, grey precepitate or as a bright mettalic mirror on the sides of test tube.

ii) Add 2 drops of 5 % of H2 SO4 in which about 20 g of salicyic acid has been dissolved and warm the liquid very gently, a permanently deep red color appears.

iii) Wt.per ml.at 20 deg.C = 1.079 to 1.094

c) Reagents

i) Hydrogen peroxide (6%)
ii) 1 N sodium Hydroxide
iii) 1 N Sulphuric acid
iv) Phenolphthalein indicator (0.5%)

d) Assay Method

i) Weigh accurately about 1 g of test sample in a conical flask.

ii) Add to it mixture of 50 ml solution of H2O2 (6%) and 60 ml of 1 N NaOH.

iii) Warm on a water bath till effervesance ceases.

iv) Titrate the excess alkali against 1N sulphuric acid using phenol-phthalein indicator to end point.

v) Note down the ml.of 1N H2SO4 used. Let it be V1.

vi) Run the blank test using same quantities of reagents in the same manner omitting formaldehyde solution, let it be V2.

e) Calculations

% age of Formaldehyde = [{60 - (V1 - V2)} X 3.003] / W

Where

V1 = ml.of 1N H_2SO_4 used in the titration
V2 = ml.of 1N H_2SO_4 used in blank determination.

8.14.6 STABILISED HYDROGEN PEROXIDE

Hydrogen Peroxide is mainly used as an oxidizing and bleaching agent in the industry and also as a Disinfectant.

Under I.S.I. specifications there are four grades of H_2O_2

Grade No.	Normal strength
Grade 1st	50% by mass
Grade IInd	35% by mass
Grade IIIrd	6% by mass
Grade Ivth	3.0% by mass

a) Description

Material must be in the form of clear, colorless liquid, free from suspended impurities and dust particles conforming to ISI grade. It rapidly decomposes in contact with oxidisable organic matter with certain metals and also if allowed to become alkaline.

b) Identification

i) Decomposes with effervescence when made alkaline and heated evolving Oxygen.

ii) To one drop, add 2 ml.of dil. H_2SO_4, shake, add 1 drop of sol.of Pot.Cromate solution and 2 ml of solvent ether. The ether layer is colored blue.

c) Reagents

i) 0.1N Pot.Permaganate
ii) 5 N H2SO4

d) Assay Method

i) Dilute 10 ml of test sample to 250 ml.in a volumetric flask.

ii) Pipette out 25 ml diluted solution

iii) Add 10 ml.of 5N H2SO4

iv) Titrate against 0.1N Pot.Permagnate to a permanent pink end point.

e) Calculations

$$\% \text{ age of hydrogen peroxide} = \frac{[\ V \times 0.01701 \times 100}{10}$$

8.14.7 POTASSIUM PERMANGANATE (KMNO4)

Potassium permanganate is used as an oxidizing agent.

Material is be of the following 3 grades under ISI specifications.

i) Technical Grade
ii) Pure Grade
iii) Analytical grade

Characteristics Grade →	Technical	Pure	AR
KMNO4 content % by	98	99	99.5
Insoluble material % by mass (max.)	1.0	0.3	0.05
Loss on heating at 110 deg.C, % by mass (max.)	1.0	0.5	--

a) Description

i) KMNO4 of technical grade to be in the form of dark, purple or irregular crystal or coglomerates.

ii) Solubility : Soluble in 15 parts of water and 3.5 parts of boiling water.

b) Identification

A solution in water, acidified with H2SO4 and heated to 70 deg.C is decolorized by solution of H2O2.

c) Reagents

i) 0.1 N oxalic acid
ii) 5 N H2SO4

d) Assay Method

i) Weigh accurately about 0.8 g of test sample in a conical flask.

ii) Dissolve it in distilled water and dilute to 200 ml. (Approx.)

iii) Add 5 ml.conc.H2SO4

iv) Heat the contents to 60-70 deg.C

v) Titrate against N/10 oxalic acid till end point.

e) Calculations

$$\% \text{ purity} = \frac{0.316 \times V}{W}$$

Where V is ml.of 0.1N used in titration
W = Wt. In g of test sample.

8.14.8 NITRIC ACID (HNO3)

Nitric acid must be of following five grades under ISI

i) Technical
ii) Nitration
iii) Explosive
iv) Chemically pure
v) Analytical pure (AR)

Technical, Nitration & Explosive Grades

Material must not be darker than pale brown in color and to be free from sediment and other visible impurities.

a) Standards

S. N.	Characteristics Grade ---->	Technical	Nitration & Explosive	Chemical Pure	AR
1.	Total acidity (as HNO3) % by mass (min.)	52.0	N -> 98.0 N -> 98.0	65.0	69.5
2.	Residue on ignition % by mass (max.)	0.1	0.05	0.1	.001

b) Description

Clear, colorless, fuming liquid conforming to ISI Technical Grade

Wt.per ml. at 20 deg.C = 1.41 to 1.42

c) Reagents

i) 1 N NaOH
ii) Methyl Orange Indicator (0.5%)

d) Assay Method

i) Weigh accurately about 4 g into a stoppered flask containing 40 ml.of water.

ii) Add few drops of methyl orange indicator.

iii) Titrate against 1N NaOH till the appearance of orange color.

iv) Note the volume in ml.of 1N NaOH used in titration.

e) Calculation

$$\% \text{ purity} = \frac{6.302 \times V}{W}$$

Where V = in ml.of 1N NaOH used in the titration
W = Wt. sample under test.

8.14.9 SULPHURIC ACID

a) Description – A colorless clear solution
b) Assay - Not less than 98.0%
c) Reagents

i) 1 N NaOH
ii) Methyl orange Indicator (0.5%)

d) **ASSAY METHOD**

i) Weigh accurately about 2 g of test sample in a stoppered conical flask.

ii) Dilute it to 40 ml.with distilled water.

iii) Add few drops of methyl orange indicator

iv) Titrate against 1N NaOH till end point.

e) Calculations

$$\%\text{age purity} = \frac{4.904 \times V}{W}$$

Where V is the ml.of 0.1N NaOH used in the titration.
W is the wt.of test sample.

8.14.10 CITRIC ACID (MONOHYDRATE)

a) Description

Material must be colorless, translucent crystal or a white granular to fine crystalline powder conforming to ISI grade. It must be odorless with a strong acidic taste. It is to be freely soluble in water, ethyl alcohol and sparingly soluble in water. It must form a clear solution in water.

ISI GRADE

Characteristics	Grade 1st	Grade 2nd
1.Citric Acid % by wt. (as mono-hydrate) (Min.)	99.7	99.5

b) Identification

Yields characteristics of citrates when neutralized .

Citrates : Citrates on heating with H2SO4 in a test tube placed in boiling water gives y a pale yellow color and evolve CO2 X CO.

c) Reagents

i) 1N NaOH
ii) Thymol Blue indicator (0.5%)

d) Assay Method

a) Weigh accurately about 3 g of test material in a conical flask.
b) Dissolve it by addition of 100 ml.of distilled water.
c) Add few drops of thymol blue indicator
d) Titrate against 1N NaOH solution till end point.

e) Calculations.

$$\% \text{ purity} = \frac{7.005 \times V}{W}$$

Where V = ml.of 1N NaOH used in titration
W = Wt.of test sample.

8.14.11 SODIUM CARBONATE (ANHYDROUS)

a) Description

Material must be in the form of granular or fine white powder, free from foreign matter, visible impurities and readily soluble in water, forming a clear colorless solution.

b) ISI Grade

Characteristic Grade ---->	Pure	AR
a) Total alkalinity as Na2CO3 % by mass of the ignited material (min.)	99.5	99.9
b)Loss on ignition at 300 deg.C % by mass (max.)	2.0	1.0

c) Reagents

i) IN HCl
ii) Methyl Orange Indicator (0.5%)

d) ASSAY METHOD

i) Weigh accurately about 3 g of sample in a conical flask.
ii) Add 50 ml. water to dissolve the contents.
iii) Add few drops of Methyl Orange Indicator
iv) Start titration with 1N HCL.

At the first color change boil the solution, cool and Complete the titration.

e) Calculations

$$\% \text{ purity} = \frac{5.3 \times V}{W}$$

Where V is ml.of 1N HCl used during the titration
W - Weight of test sample.

8.14.12 BLEACHING POWDER

Stable bleaching powder is a carrier of Chlorine. It differs from others as it retains it's available chlorine content for longer periods when stored properly .

a) Stability

Difference in the chlorine equivalent of the hypochlorite chlorine present in the sample before and after heating it for 2 hours at 100 +/- 2 deg.C.

b) Description

Stable bleaching powder must be white to slightly Yellowish white in appearance and free from hard lumps and any visible impurities.

		Grade Ist	Grade IInd
a)	Availble Cl2 present by wt.(min)	35.0	33.0
b)	Stability loss of Cl2 on the basis of initial Cl2 (Max.)	1/15	1/11
c)	Moisture % by wt.(max.)	0.3	0.5

c) Keeping quality

Material of both the grades must comply with minimum available Cl2 content for not less than 30 days from the date of inspection or date of dispatch whichever is earlier.

d) Reagents

i) Potassium Iodide
ii) Glacial Acetic Acid
iii) 0.1N Sodium Thiosulphate
iv) Starch Indicator (0.5%)

e) Procedure

i) Weigh accurately about 2.5 g of sample and grind in mortar with water till smooth paste is formed.

ii) Decant in conical flask with repeated washing and make up the volume 250 ml.

iii) Take 25 ml of this diluted solution.

iv) Add about 2 g of Pot.Iodide (solid).

v) Add 100 ml of water.

vi) Add 2 ml of glacial acetic acid.

vii) Titrate against standard 0.1N sodium Thiouslphate solution till pale yellow color is left.

viii) At this stage, add starch indicator (0.5%) few drops and continue the titration till blue color disappears.

f) Calculations

$$\% \text{ of purity} = \frac{A \times N \times 35.46}{W}$$

Where
A = Volume in ml.of 0.1N Na2S2O3 used in titration
N = Normality of Na2S2O3
W = Wt.of sample.

8.14.13 SODIUM CITRATE (DIHYDRATE)

a) Purity

Sodium citrate contains not less than equivalent of 100%

b) Description

Colorless crystal or a white crystalline powder, Odorless, taste saline, slightly deliquescent in moist air.

c) Solubility

Soluble in 1.5 part of water and in 0.6 part of boiling water. Practically insoluble in alcohol.

d) Identification

i) Sodium compound

Moistened with HCL and introduced on platinum wire into flame of 'Bunsen burner' gives a yellow color to the flame. Solution of sodium salt yields with solution of uranyl zinc acetate, a yellow crystalline precipitate.

ii) Citrates

Citrates on heating with sulphuric acid in a test tube placed in a boiling water bath gives a pale yellow color and evolve carbon - dioxide and carbon monoxide.Neutral solution of citrates yields with an excess of solution of AgNO3 a white precipitate soluble in nitric acid and dil. ammonia solution.

e) Reagents

i) 0.5 N sulphuric acid
ii) 0.5 N sodium Hydroxide
iii) Methyl Orange Indicator

f) Assay Method

i) Weigh accurately about 2 g of test sample in a conical flask.

ii) Heat it on hot plate till decarbonised and then cool.

iii) Add 50 ml.of water followed by 50 ml.of 0.5 N H2SO4.

iv) Boil the contents.

v) Filter the contents of conical flask and collect the filtrate in another conical flask.

vi) Wash the filter paper with water twice and collect it alongwith filtrate.

vii) Add few drops of methyl orange indicator.

viii) Titrate with 0.5N NaOH till end point.

g) Calculation

% purity ---> 4.902 X V/W

Where V is ml.of 0.5 N NaOH used in titration.
W = wt.of test sample.

8.14.14 DISODIUM PHOSPHATE

a) Purity

Sodium phosphate contains not less than 99% and not more than the equivalent of 100% of Na2HPO4 calculated with reference to the substance dried to constant weight at 130 deg.C.

b) Description

Colorless, crystal, odorless, taste saline, efflorescent in dry air.

c) Solubility

Soluble in water, & insoluble in alcohol (90.0%).

d) Identification

Yield the characteristics of sodium and phosphate

e) Reagents

i) 0.5 N H2SO4
ii) Bromocresol indicator (0.5%)

f) Assay Method

i) Weigh accurately about 6 g of test sample in a conical flask.

ii) Add 100 ml of water to dissolve it.

iii) Add few drops of Bromocresol indicator.

iv) Titrate against 0.5 N H2SO4 till end point.

g) Calculations

$$\% \text{ purity} = \frac{7.098 \times V}{W}$$

Where V is the ml.of 0.5 N H2SO4 used during titration.
W is wt.of test sample.

8.14.15 ISO AMYL ALCOHOL

A) Grade (1)

a) Characteristics	ISI Requirements
1. Color	Clear and colorless
2. Water content	Shall pass the test
3. Solubility in water	-- do --
4. Distillation range	Not less than 95 ml within 2 degree in the range 128 to 132 deg.C.
5. Furfural and other organic impurities	shall pass the test
6. Suitability for milk analysis	-- do --
7. Hydrochloric acid test	-- do --

B) Test for water content

a) Procedure

i) Take 5 ml of test sample in a 100 ml cylinder.
ii) Add 95 ml.of petroleum hydrocarbon solvent.
iii) Shake the contents.
iv) Keep the cylinder at 27 +/- 2 deg.C

b) Interpretation

The material is to be regarded as passed the test, if no turbidity develops in the mixture.

C) Test for Solubility in water

a) Procedure

i) Measure 50 ml of material in 100 ml. graduated cylinder.

ii) Add 50 ml.of water.

iii) Adjust the temperature to 20 deg.C and shake well and allow to stand.

iv) Observe the volume of the alcohol layer.

b) Inference

The material shall be taken to have passed the test if the volume of the alcohol is not less than 45 ml.

D) Test for Furfural and other organic impurities

It is based on halochromy developed by furfural and other organic impurities in the material with conc. H_2SO_4.

a) Procedure

i) Take 5 ml of test material in a test tube
ii) Add 5ml of conc.H_2SO_4.
iii) Mix the contents of tube.

b) Interpretation

The material shall be taken to have passed the test if the solution does not show more than a yellow or light brown color.

E) Test for suitability for milk analysis

Gerber test is carried out using water instead of milk. Butyrometer reading must report absence of any fat. Besides the same milk when examined by Gerber Method using the material to give a figure of fat contents not differing by more than a stipulated limit.

F) Hydrochloric acid test

The material is mixed with an equal volume of conc. HCL and examined for complete miscibility. However 1 ml. water added to the mixture, separates the mixtures into 2 layers.

a) Procedure

i) Take 10 ml.of test sample in a test tube.

ii) Add 10 ml.of conc.HCL.

iii) Shake well.

b) Inference

The material to be considered passed if a clear Solution is formed and the solution separates into two layers on the addition of 1 ml of water.

8.14.16. BUTYLATED HYDROXYANISOLE (FOOD GRADE) BHA

Identification

i) When 2 ml. of 2% aquous borax solution and a few small crystal of 2,6-dichloroguinone chlormide are added to an ethanolic solution (1% m/v) of BHA, a blue color appears.

ii) When 2 ml. of ferric chloride (0.2%) FeCl3.6 H2O in absolute Alcohol and 2 ml. of 0.2% 2,2 bipyridine in absolute ethanol are added to 5 Ml. of 0.5% BHA in 50% ethanol, a red color appears.

SPECIFICATIONS

i) Purity as C_11_H_16–O_2_% by mass must be minimum 98.5%
ii) Aresenic (mg/kg) max - 3
iii) Heavy metals (A & Pb) (mg/kg) max - 10
iv) Iron (mg/kg) max - 5

8.14.17. SUGAR

i) Description : The sugar shall be white, odorless and soluble in cold water.

ii) Coloring matter : Sugar shall not contain any coloring matter.

iii) Foreign matter : Sugar shall be free from dirt and other extraneous matter. The presence of insects, rodents and other animal contamination shall be regarded as serous defect.

SPECIFICATION_

i)	Polarization % (min)	- 99.8
ii)	Moisture % (Bywt)max	- 0.05
iii)	Reducing sugar % (bywt) max	- 0.1
iv)	Sulphated Ash % (bywt) max	- 0.05
v)	Aresenic (PPM) max	- 1
vi)	Lead (PPM)	- 2
vii)	SPC/g max	- 100
viii)	Yeast/g Moulds/g	- Nil - 10
ix)	Total Thermophilic Count/10g max	- 150

8.14.18 DETERMINATION OF % PURITY OF FERRIC ALLUM

1. Reagents
   a) Conc. HCL
   b) Stannous Chloride (0.2 N)
   c) Mercuric Chloride (Saturated)
   d) N/10 Pot.Dichromate Solution
   e) N-Phenyl Anthranilic Acid (0.1 %)

II. Procedure

a) REDUCTION

1. Take 20 ml of test solution in the titration flask.
2. Add 2,3 ml of Conc. HCL and heat to boil.
3. Then add dropwise stannous chloride solution with shaking till yellow color of solution disappear.
4. Then add 2-3 drops more cool the flask containing the solution at once under the tap.
5. Then add 10 ml of saturated solution of mercuric chloride rapidly in one lot and with thorough mixing to remove excess of stannous chloride.

b) TITRATION

6. After reduction, add 20 ml of sulphuric acid and titrate against pot.dichromate solution using N-phenyl anthranilic acid till green color changes to violet red.

c) CALCULATIONS :

Applying normality equation

$$N_1 V_1 \text{ (Ferric Alum)} = N_2 V_2 \text{ (Pot.Dichromate)}$$

$$N_{\text{Ferric Alum}} = \frac{N\,V}{20}$$

$$\% \text{ Purity of ferric alum} = \frac{\text{Normality of pot Dichromate}}{10} \times \text{Eq.Wt.}$$

$$= \frac{N\,V \times 482}{200}$$

Indicator : Dissolve 0.25 gms of N-Phenyl Anthranilic acid in 12 ml 0.1N NaOH and dilute to 250 ml with distilled water.

Stannous Chloride : Dissolve 12 gm metallic tin or 30 gm stannous chloride Chloride in 250 ml Conc.HCL and dilute to 1 Litter.

SPECIFICATIONS OF FERRIC ALUM (FERRIC AMMONIUM SULPHATE)

1. Percentage purity of Ferric Ammonium Sulphate = 7.5(Min.)
2. 2. Acidity of Ferric Ammonium Sulphate = 1.5 (Max.)

ACETIC ACID

a) REAGENTS

i) 1 N NaOH
ii) Methyl Orange Indicator (0.5%)

b) ASSAY METHOD

i) Weigh accurately about 3 gm. of sample in a stoppered conical flask.
ii) Dilute it to 40 ml. with distilled water.
iii) Add few drops of Methyl Orange Indicator.
iv) Titrate against 1N NaOH till end point.

At the first color change boil the solution, cool and complete the titration.

c) CALCULATIONS

$$\%\text{age purity} = \frac{6.004 \times V}{W}$$

Where V is ml. of 0.1N NaOH used in the titration.
W - Weight of test sample.

8.14.19 PREPARATION OF COMMON REAGENTS

1) Acetic acid : Glacial acetic acid is approximetly 12 N. Dilute 1 part of acid with 2 parts of water. This solution is approximately 6 N.

2) Alcohol Alizarin solution : Dissolve 0.2 g of alzarin powder in 100 ml of 75 percent ethly alcohol.

3) Ammonium Acetate : Approximately 3 N solution. Dissolve 231 g of ammonium acetate in 1 litter of water or dilute 800 ml. of conc. acetic acid with 300 ml of distillled water and neutralize with conc. ammonia and dilute to 1 litter. The solution is approximately 5 N.

4) Ammonium Carbonate : Approximately 6 N solution. Dissolve 200g of soild ammonium carbonate in 350 ml of ammonium hydroxide and dilute to 1 litter with distilled water.

5) Ammonium hydroxide : Conc. Ammonia is about 15 N. Dilute 2 parts of conc. ammonia with 3 parts of water. The solution is 6 N.

6) Ammonium molybdate : Dissolve 50 g of 85 percent molybedic acid in 120 ml of water and 70 ml of ammonium hydroxide. Add 30 ml of conc. nitric acid and cool. Add the solution with constant stirring to a mixture of 200 ml conc. nitric acid and 480 ml of water. Filter the solution before use.

7) Ammonium oxalate 0.5 N solution: Dissolve 35 g of ammonium oxalate in distilled water amd make up to 1 litter.

8) Barium chloride 1 N solution : Dissolve 122 g of crystalbline arium chloride in distilled water and make up to 1 liter

9) Bromo-cresol Purple solution : Dissolve 0.1 g of Bromcresol purple in 100 ml of alcohol and filter if necessary.

10) Cupric sulphate: 0.5 N solution. Take 63.0 g of crystalline copper sulphate, dissolve it in distilled water, acidified with 5 ml of dilute sulphuric acid and make it to 1 litter.

11) Ferric chloride 3 N solution : 270 g of ferric chloride are dissolved per 1 litter of solution with sufficient quantity of conc. Hydrocloric acid to prevent hydrolysis.

12) Fehling's solution : fehling'solution is made by mixing equal amounts of fehling A and fehling B. Fehling A is copper sulphate solution. Dissolve 34.639 g of crystalline copper sulphate (CuSo4, 5H2O)in distilled water and dilute to 500 ml and filter through prepared asbestos. Fehling B is the alkaline solution of sodium potassium tartrate (Rochelle salt). Dissolve 173 g of gochelle salt in about 300 ml of distilled water. In another beaker dissolve 50 g of sodium hydroxide in about 100 ml of distilled water. Mix the two solutions and make up the volume to 500ml. ml with distilled water. Allow to stand for 2 days and filter through prepared asbestos.

13) Hydrochloric acid : Conc. Hydrochloric acid is about 12 N.dil. 1 lt. of conc. HCL with D.W & make up to 6 lt.. to get 2 N solution.

14) Iodine solution : 0.01 N solution. Dissolve 1.3 g of iodine in distilled water with sufficient quantity of potassium iodine and make up to 1 liter.

15) Mercuric chloride: (0.4 N solution) Dissolve 54 g of mercuric chloride in distilled water and make up to 1 litter.

16) Mercuric nitrate : Dissolve 10 g crystalline mercuric nitrate per 100 ml of distilled water and add 1 ml of conc.nitric acid.

17) Nitric acid : Concentrated nitric acid is approx.15 N. Dilute concentrated nitric acid in the ratio of 2:3 with distilled water to get approximately 6 N solution.

18) Nessler's reagents : Dissolve 50 gm of potassium iodide in smallest possible amount of distilled water. Add a saturated solution of mercuric chloride until an excess is indicated by the formation of a reddish precipitate. Add 400 ml of 50 percent solution of potasssium hydroxide. Make upto 1 litter. Allow to settle and decant off the clear solution.

19) Potassium chromate : 5 percent aqueous solution.

20) Potassium iodide : 6 N solution. Dissolve 166 g of potassiumiodide in distilled water and make upto 1 liter.

21) Potassium permagnate : 0.1 N solution. Dissolve 3.2 g of potassium permangante crystals in water and make upto 1 litter.

22) Potassium Thiocyanate : Dissolve 9.7 g of potassium thiocyanate in distilled water and make upto 1 litter. .

23) Phenolphthalein Indicator : Dissolve 1 g of phenolph thalein in 110 ml of ethylalcohol (95-96 percent). Add approximately decinormal sodium hydroxide solution untill one drop gives faint pink coloration. Make uoto 200 ml with distilled water.

24) Rosaniline acetate : aqeuous solution. Stock solution A. Dissolve 0.12 g of rosaniline accetate in approxi mately 50 ml ethyl alcohol (95-96 percent) containing 0.5 ml of glacial acetic acid and make upto 100 ml with ethyl alcohol.

25) Bench solution B : Dilute 1 ml of solution A to 500 ml with a mixture of ethyl alcohol (95-96 percent) and distilled water in equal proportions by volume.
Note :- Solution A and B are to be stored in dark bottles, securely stopped with rubber bungs.

26) Silver Nitrate 0.1 N solution : Dissolve 15.8 g of silver nitrate in distilled water and make upto 1 litter.

27) Sodium Carbonate : 3 N solution. Dissolve 159 g of crystalline sodium carbonate in distilled water and make upto 1 liter.

28) Sodium Hydroxide : (i) 50 percent solution (weight by weight). Take 50 g of sodium hydroxide pellets and dissolve in 100 ml distilled water.

29) N/9 NaOH-carbonate free: A litter of N/9 sodium hydroxide solution contains 4.445 g of sodium hydroxide. Since it is not available in pure state, it is not possible to prepare an exact solution by direct weighting, therefore a solution stronger than N/9 is first prepared and its exact strength determined by titrating against a standard acid, and the calculated quantity of water is added to bring the solution to the required strength.

Sodium hydroxide absorbs carbon dioxide on exposure to atmosphere and will be contaminated with sodium carbonate such a solution when titrated with acid will liberate carbon dioxide which will interfere with the indicator phenolphthalein. Therefore it is essential to prepare carbonate free solution.

Weigh in a large beaker 500 g of sodium hydroxide sticks or pellets, and 500 ml of distilled water. The beaker must be covered with a watch glass and the mixture stirred occasionally until the sodium hydroxide has dissolved. A considerable heat is evolved, cool the solution by keeping the beaker on an asbestos or cork mat. When cool transfer to stoppered cylinder and keep it aside for a few days. (Sodium carbonate free sodium hydroxide solution).

Transfer 6.3 ml of the 50 percent solution to a litter measure flask using a measuring cylinder. Add fresh distilled water and make up the solution to the mark and mix it well for uniform concentration. Find out the strength of this solution by titrating against N/10 oxalic acid. Calculate the volume of this solution required to make a liter of N/9 solution by using the formula N1V1 = N2V2. Measure this volume to a litter measuring flask carefully and uniform concentration. This solution will be exactly N/9 sodium hydroxide and its strength to be checked occasionally.

30) Sodium phosphate : 10 percent solution:- Dissolve 100 gm of crystalline disodium monohydrogen phophosphate in 100 ml distilled water.

31) Sulphuric acid (1) Concentrated approx. 36 N solution. (ii) 6 N Solution. Dilute the conc. acid in the ratio of 1 : 6 with distilled water by addition of acid to water with stirring. (iii) Gerber acid - Sp. gravity 1.815 to 1.820 at 20 deg.C. The specific gravity of commercial sulphuric acid is about 1.84. There it is necessary to dilute commercial acid with calculated amount of water.

Take the commercial acid in a suitable measuring cylinder and find out its specify gravity at 20 deg. c by using a hydrometer ranging between 1.800 to 2.000. From this calculate the volume of acid required to prepare the known quantity of Gerber acid by using the formula S1V1 = S2V2 where Standard S1 and S2 are the specify gravities and V1 and V2 are the volumes of commercial and gerber acids respectively.

Take the calculated volume of distilled water in a convention flask kept in a basin of ice cold water and carefully add the required volume of commercial acid in small quantities at a time, keeping the container sufficiently cold. Mix gently and cool to 20 deg. c. Check the specific gravity of the diluted acid as in the case of commercial acid.

32) Starch Solution : Dissolve 1 gm of soluble starch in about 20 ml cold water. pour the solution in 80 ml of hot water and boil for a few minutes. Keep in a glass stoppered bottle.

33) Acidified Mercuric Nitrate Solution : Dissolve mercury in twice its weight of strong nitric acid and dilute with an equal volume of distilled water.

34) Mercuric Iodine Solution : Dissolve 33.2 g potassium iodide and 13.5 g of mercuric chloride in 20.ml of glacial acetic acid and 640 ml of distilled water.

35) Methyl Orange : Dissolve 1.0 g of methyl orange in distilled water and dilute to 1 litter. Filter if necessary.

36) Mixed Indicator : (methyl red-methylene blue)-2:1

37) Solution A : Dissolve 0.2 g of methyl red in 95-96 percent alcohol and make upto 100 ml with alcohol.

38) Solution B : Dissolve 0.2 g of methylene blue in 95-96 percent alcohol and dilute to 100 ml with alcohol.

Mix 2 parts of solution A with 1 part of solution B.

39) Cleaning Acid Solution : (Chromic Acid)

Dissolve 80 g of Potassium dicromate in 300 ml. tap water. Add 460 ml of conc. H2SO4 with constant stirring. Instead of chromic acid, 1% pot. Permangnate solution which is easier to handle can be used for preliminary cleaning of pipettes. After removing the pipettes from chromic acid, they should be washed with water to remove all traces of acid.

8.15 SPECIFICATIONS FOR K.P. BAGS (L-STICHED)

S. NO.	PARTICULARS	LENGTH BREADTH (IN INCHES)	WEIGHT (+/- 10g)
1.	K.P.Bags (Premium)	43" x 22"	230.0 g.
2.	K.P.Bags (Premium Grade Special)	40" x 22"	210.0 g.
3.	K.P.Bags (Baker – 555)	39" x 22"	205.0 g.
4.	K.P.Bags (Export Grade)	39" x 21.5"	500.0 g.

a. Outer layer, semi Kraft paper having 80 GSM laminated to HDPE natural white fabric (75 GSM) using 33 micron virgin grade LDPE.

b. Printing : As per our color scheme & design

c. Double stitched at bottom & side with Kraft paper tape using 2 Ply rayon thread chain type.

d. When Kraft paper bag filled with 25 Kg. powder is dropped from a height of 9 feet it must not tear off /get damaged / burst.

e. For export grade K.P.Bags, use white crape paper of 80 gsm, laminated with 120 gauge HDPE with 02 ply semi Kraft paper (Brown color).

f. K.P.Bags printed in two colors as per our design.

8.15.1 SPECIFICATION FOR POLY LINER 1 Kg.(PRINTED)

S. NO.	PARTICULARS	LENGTH (mm)	BREADTH (mm)	THICKNESS (micron)	WEIGHT (g .)
1.	SMP (Premium)	320mm x 245mm		75	11.0 - 11.5
2.	SMP (Premium Grade)	320mm x 230mm		75	10.0 - 10.5
3.	Baker 555	320mm x 230mm		75	10.0 - 10.5

a. Type of bags : Printed as per our design in double color.

b. Material : A grade (LDPE food grade virgin material). It is to be manufactured from raw material i.e. 23 FY 005/MP & blending with 30% LLDPE. (Butane)

c. Drop Test :When filled pouches packed in 25 Kg.bags are dropped from a height of 6 feet, it must pass the test.Failure must not be more than 5%.

d. Printing : It must pass the tape test.

e. Art Work : Art work must be got approved before commercial production.

f. Seaming : Must be seamed (double) at 1 Cm. from the bottom

g Gauge : Poly Liner must be of uniform gauge (300)without any weak points and pin holes

8.15.2 SPECIFICATIONS FOR POLY LINER 25 Kg. (PLAIN)

A grade (LDPE food grade virgin material). It is to be manufactured from raw material i.e. 23 FY 005/MP & blending with 40% LLDPE.(Butane)

SNo. Particular	Length (In Inches)	Breadth	Weight (In Grams)	Gauge
1. Poly Liner for 25x1 Kg.SMP (Low B.D.)	45"	23"	60.0 - 65.0 g.	200
2. Poly Liner For 25 x 1 Kgs SMP(High B.D.)	42"	23"	55.0 - 60.0 g.	200
3. Poly Liner for Bulk SMP	41"	23"	95.0 - 100.0 g.	350

Drop test : When filled polyliner dropped from the height of 6 feet, it must pass the test. Failure must not be more than 5%

Gauge : Polyliner must be of uniform gauge without any weak point and pin holes.

3. Number of Tests

The number of sacks to be selected for testing the requirements of construction, dimensions and stitching are to be according to column 3 of Table 3, in clause IV thereafter. Equal number of sacks are to be selected from each truss.

---

4. Table 3 Sample size and criteria for conformity.

No.of Trusses In the Lot	No. Of Trusses To be selected	No. of sacks to be selected	Permissible No. of Defective Sacks
(1)	(2)	(3)	(4)
1	1	5	0
2	2	8	0
3 to 6	3	12	0
7 to 20	5	20	1
21 to 70	8	32	2
71 and above	13	52	3

8.15.3 10 KG WMP TINS

a) Specifications for 10 Kg WMP Tins.

i) General Requirements

Square Biscuit type tin for packing 10 Kg Milk Powder made of 0.28mm thick prime quality tin plate, made out of Electrolytic 'TIN PLATE SHEET' equally coated i.e. 11.2 GMS.Tin Plate coating with lids and taggers duly printed as per specifications in single color.

ii) Size of the tin
237 +/- 3mm x 237 +/- 3mm x 340 x 15mm

iii) Other conditions

1) Tins must be new and in clean condition externally and internally. The tins must be free from rust and foreign material/dust. Mouth of tin must be closed with BOPP tape.

2) The gross capacity of the tin measured with water filled at 27 deg C + - 2 deg C. not to be less than 18.00 ltrs.

3) The tins must conform to ISI specifications strictly.

4) Art work must be got approved before commercial production

8.15.4 PARCHMENT PAPER

a) **Specifications** : Vegetable parchment paper must not have any offensive odor and rupture on twisting or folding. It is to be white, smooth and uniform in texture and free from pin holes.

Vegetable parchment paper to be water, oil and air resistance. It must not disintegrate into individual fibers when 1 to 2 sq.cm.of paper is treated with 0.5N NaOH in a tube and kept in boiling water bath for 10 Mts. and shaken for 5 Mts. It must also not disintegrate in salt solution and mild acids. It must not contain impurities like starch, gelatine, casein and lead material in the form of minerals.

b) Other requirements

i)	Grammage per sq.mt.	... 44
ii)	Bursting strength (min) (dry)	... 2.0 kg,/cm2
iii)	pH value	... Between 5.5 to 7.0
iv)	Moisture content (max)	... 7%
v)	Water soluble chloride as NaCl (max.)	... 0.20%
vi)	Grease resistance	... Should pass the test.
vii)	Art work must be got approved before commercial production	

.

c) **Scale of sampling**

	No. of rolls or packages in the lot	No. of rolls or pack to be selected	Permissible number of defective test sample For Rolls	For Packages
1.	Up to 100	5	0	1
2.	101 to 150	8	0	1
3.	151 to 300	13	0	2
4.	301 and above	20	1	3

d) **Testing procedure**

i) **Bursting strength**

The Mullen tester is a machine which clamps a sheet of sample between two annular ring clamps. The lower ring's aperture is closed by rubber diaphram. When the instrument is activated, a fluid usually glycerol is pumped from beneath the diaphram causing it to expand in a dome shape. As the diaphram expands, it presses upward against the test sample and deflect upward also. The operator observes the point of rupture of the sample and instantly releases the pressure to avoid rupture of diaphram. The rupturing force is indicated on instrument pressure and reported as kg/cm2.

8.15.5 TEST FOR GREASE RESISTANCE.

a) Reagents :- Turpentile oil

b) Procedure

i) Keep about 5 gm.of sand on the sample of parchment paper on a smooth surface.

ii) Place drop wise 1 ml.of turpentine oil and keep it for half to 1.0 hour.

iii) Observe the paper after removing sand.

iv) If, paper becomes oily, it is not grease resistant type.

v) If paper remain unaffected it may be considered grease resistant type.

c) **Scale of sampling**

	No. of rolls or packages in the lot	No. of rolls or pack to be selected	Permissible number of defective test sample For Rolls	For Packages
1.	Up to 100	5	0	1
2.	101 to 150	8	0	1
3.	151 to 300	13	0	2
4.	301 and above	20	1	3

d) **Testing procedure**

i) **Bursting strength**

The Mullen tester is a machine which clamps a sheet of sample between two annular ring clamps. The lower ring's aperture is closed by rubber diaphram. When the instrument is activated, a fluid usually glycerol is pumped from beneath the diaphram causing it to expand in a dome shape. As the diaphram expands, it presses upward against the test sample and deflect upward also. The operator observes the point of rupture of the sample and instantly releases the pressure to avoid rupture of diaphram. The rupturing force is indicated on instrument pressure and reported as kg/cm2.

8.15.5 TEST FOR GREASE RESISTANCE.

a) Reagents :- Turpentile oil

b) Procedure

i) Keep about 5 gm.of sand on the sample of parchment paper on a smooth surface.

ii) Place drop wise 1 ml.of turpentine oil and keep it for half to 1.0 hour.

iii) Observe the paper after removing sand.

iv) If, paper becomes oily, it is not grease resistant type.

v) If paper remain unaffected it may be considered grease resistant type.

8.15.6 STARCH

a) Procedure

i) Take 10 gm.sample, cut into pieces not over 0.25 gm each, weigh out from this an exact 5.0 gm.

ii) Transfer it into wide mouth 500 ml conical flask.

iii) Add 250 ml. Distilled Water,

iv) Extract for 1.0 hour on a boiling water bath and then pour the contents of flasks through a buchner funnel (without filtering device) washing the pieces remaining in the flask with 10 ml. distilled water.

v) Apply strong suction and cool the extract rapidly.

vi) Take 10 ml.of this solution.

vii) Add 2 drops of 0.01N iodine solution.

viii) Inference

If blue color appears, this indicate presence of starch

8.15.7 GELATINE

a) Procedure

i) Boil rolled up strip of sample (1 X 4 cm) with 10 ml.of water in a test tube.

ii) Take 5 ml.of extracted sample and add few drops of 2% Tannic acid.

b) Inference

Development of gray white precipitate is indicative of presence of gelatine.

c) Specifications For Ink/Printing Of Parchment Paper Requirement

i) Ink used for printing of parchment paper must be suitable for flexo-graphic /rotogravure printing.

ii) The ink and the resulting printing must have sufficient light fastness. The printed specimen when subjected to ordinary sun light at 45 angle exposure on a clear day, not to show appreciable change within 48 hours.

iii) The ink must not bleed through wrapper.

I) The printing must pass through the following tests

i) The printed and wetted specimen immersed in distilled water and kept there in for 48 hours not to show any sign of removal of ink on slightly rubbing with cotton.

ii) Printing parchment paper to be immersed in 15-20 deg.C sodium chloride solution for 48 hours. The ink to stand and must not show any sign of removal on rubbing slightly with cotton.

iii) Printed parchment paper to be immersed in 2% ammonium hydroxide solution for 48 hours. The ink to stand in the solution and not to show any sign of removal on rubbing slight with cotton.

iv) Coldness : Fat- melted or pressed is placed in petridish so as to obtain as flat a surface as possible. The printing side of paper not less than 20 X 50 mm is placed in contact with fat and pressed down so as to obtain complete and even contact over its surface. The dish containing the specimen is allowed to stand for 24 hours at 20 +/- 2 deg.C and then placed for 1 hour in refrigerator at 4 +/- 2 deg.C to facilitate removal of specimen.

v) Observations

The specimen is removed and examined for change in color

vi) Interpretation

A change in color of the print caused by the absorption of fat indicated poor quality of ink.

vii) Hot melt test

Take 10 gm.of butter in a porcelain dish and heat to 90 - 95 deg.C in an oven. Dip the print under test into molten butter for 24 hours and see color must not be visible on the butter.

8.15.8 BUTTER CARTONS

a) Specifications For 100 Gm.Butter cartons.

Printed butter 100 g cartons manufactured from 245 white duplex board extrusion Poly coated with 15 GSM low density polyethylene on the outside, printed in upto six colors, cut, creased, side seamed and supplied flat in diameter 10 X 65.5 X 18.5 mm

b) Specifications for 200 Gm.Butter cartons.

Printed butter 200 g cartons manufactured from 245 white duplex board polycoated with 15 GSM low density polyethylene on the outside, printed in upto 6 colors, cut creased side seam glued and supplied flat in diameter 117 X 57 X 31 mm.

c) Art work must be got approved before commercial production

8.15.9 SPECIFICATIONS OF PANEER POLY LINER 200 gms

Made out of 23FY005/MP A Grade granules (LDPE food grade virgin material) blended with 20 % LLDPE. Size : 200 mm X 132 mm X 250 Gauge. With veg. Green color logo on right side of Milk Time logo (Dia.of green circle 4.00 mm , size of square outside of circle 8.0 mm.)

8.15.10 SPECIFICATIONS OF PANEER POLY LINER 1.0 Kg

Made out of 23FY005 A Grade granules (ldpe food grade virgin material) blended with 80% ldpe & 20 % lldpe white Pigmented printed in double colors as per Milk Time logo. Size : 305 mm X 200 mm X 300 Gauge. weight per liner 8.5 gms. With veg. Green color logo on right side of Milk Time loge (dia of green circle 4.00 mm , size of square outside of circle 8.0 mm.)

8.15.11SPECIFICATIONS OF CORRUGATED BOXED

Sr. No.	Description	Inner Dimension (mm) (+ / - 2 mm)	Bursting Strength GSM	Ply Size	Color of Printing
1.	24 x 2 lt. Ghee Tin with 1 separator, 3 ply each 100 GSM	365 x 265 x 225	9.6 kg / Cm	120 x 5	BLUE
2.	18 x 1 lt. Ghee Tins with 1 separator, 3 Ply each 100 GSM	340 x 340 x 275	9.6 kg / Cm	120 x 5	BLUE
3.	6 x 2 lt. Ghee Tins	425 x 285 x 160	12 kg / cm	150 x 5	BLUE
4.	4 x 5 lt. Ghee Tins	365 x 365 x 240	12 kg / cm	150 x 5	BLUE
5.	15 kg Ghee tin – light	240 x 240 x 340	6.0 kg / cm	120 x 3	BLUE
6.	12 x 1 lt. Mona Carton	425 x 215 x 180	9.6 kg / cm	120 x 5	BLACK
7.	36 x 1 / 2 lt. mono Carton with 1 separator, 3 Ply each 100 GSM	350 x 255 x 290	9.6 kg / cm	120 x 5	BLACK
8.	24 x 1 2 lt. Ghee Pouch	250 x 250 x 240	9.6 kg / cm	120 x 5	GREEN
9.	16 x 1 lt. Ghee Pouch	370 x 230 x 220	9.6 kg / cm	120 x 5	GREEN
10.	18 x 1 lt. Poly jar ghee with 1 separator, 3 play each 100 GSM	330 x 330 x 310	9.6 kg / cm	120 x 5	RED
11.	36 x ½ lt. Polyjar ghee with 1 separator, 3 Ply each 100 GSM	347 x 260 x 385	12.0 kg/cm	150 x 5	RED
12.	6 x 2 lt. Polyjar Ghee	410 x 280 x 195	9.6 kg / cm	120 x 5	RED
13.	4 x 5 lt. Polyjar Ghee	380 x 380 x 255	12.0 kg/cm	150 x 5	RED
14.	10 kg Polyjar White for Dairy Whitener	238 x 238 x 395	6.0 kg/cm	120 x 3	BLUE

8.15.12SPECIFICATIONS OF CORRUGATED BOXED

Sr. No.	Description	Inner Dimension (mm) (+ / - 2 mm)	Bursting Strength GSM	Ply Size	Color of Printing
15.	60 x 200 Gm Poly Jar for Dairy Whitener With 2 separators, 3 ply each 100 GSM	380 x 300 x 345	9.6 kg/cm	120 x 5	BLUE
16.	24 x 500 gm Poly Jar for Dairy Whitener with 1 separator, 3 ply each 100 gsm	400 x 300 x 280	9.6 kg / cm	120 x 5	BLUE
17.	10 kg tin for WMP	240 x 240 x 343	6.0 kg/cm	120 x 3	BLUE
18.	20 kg White Butter	355 x 355 x 205	9.6 kg/cm	120 x 5	BLUE
19.	160 x 100 gm Butter Outer layer to be bituminised	400 x 213 x 275	12.5 kg/cm	120 x 5	BLUE
20.	32 x 500 gm Butter Outer layer to be bituminised	300 x 260 x 260	12.5 kg/cm	150 x 5	BLUE
21.	60 x 200 gm Milk Cake	355 x 295 x 162	9.6 kg/cm	120 x 5	BLUE
22.	12 x 200 ml SFM Bottle	220 x 167 x 160	5.0 kg / cm	100 x 3	BLUE
23.	24 x 100 ml Ice – cream E-flute	310 x 155 x 130	5.0 kg cm	100 x 3	BLUE
24.	12 x 200 gm Curd Cups	495 x 165 x 85	5.0 kg cm	100 x 3	BLUE
25.	100 x 200 gm Paneer	463 x 370 x 185	9.6 kg / cm	120 x 5	GREEN

Prepared by **H O D**	Approved by **CEO**
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMMRP – 02]

NOTE:-

1. Maximum gap between flaps of cartons must not be more than 2mm
2. Gross weight 4.7kg.is to be mentioned on SFM c.boxes hereafter.
3. Paper affixing on the staples inside the cartons in respect of Poly pouch ghee cartons only.
4. Food grade adhesive to be used.
5. Moisture % of cartons must not be more than 8%.
6. Printing must be legible .
7. Master cartons in case of 1 ltr.poly pouch,1 ltr.ghee tins,1ltr. Poly jars,1 ltr.mono box.(brand name logo to be omitted).
8. Every carton must have quality assurance logo on right side of top flap.

8.15.13 TIN CONTAINER

a) Specifications of Tin Container

Decorated round built up tagger top liver lid containers made from PRIME QUALITY TIN PLATE, manufactured on automatic body maker bottom compound lined and supplied loose, compound lined top fitted Aluminum diaphram and liver lid seamed on body. Body printed externally in approved colors (four colors) as per design and lids unprinted, bodies stencil varnished. Inside the bodies & bottom food lacquered. Side seam suitably treated.

NON – BEADED TIN						BEADED TINS			
SR NO	ITEM	TRADE SIZE	THICKNESS OF TIN PLATE FOR (TOP + BOTTOM	SIZE IN MM		Tin Coating	THICK NESS	Body ± 2g	Bott ± 2g
				BODY	LID				
1.	½ kg / lt Ghee Tin	307 x 408	0.20	0.20	0.19	5.6gm/m equalize coated	0.19	60	14
2.	1.0 kg / lt	404 x 510	0.20	0.21	0.19	-- do --	0.19	95	19
3.	2.0 kg/lt	509 x 607	0.22	0.24	0.19	-- do --	0.22	165	35
4.	5.0 kg/lt	700 x 914	0.24	0.27	0.19	-- do --	0.24	320	55
5.	½ kg WMP Tin	404 x 510	0.20	0.21	0.19	-- do --	0.19		
6.	1.0 kg WMP TIN	509 x 601	0.22	0.24	0.19	-- do --	0.22		
7.	½ kg Baby Food tin	404 x 510	0.20	0.21	0.19	-- do --	0.19		
8.	1.0 kg Baby Food Tin	509 X 601	0.20	0.24	0.19	-- do --	0.22		

b) Art work must be got approved before commercial production.

GENERAL

1. Lacqured to be used of Food Grade in light golden colour.

c) Methods for sampling of metal container's - lot inspaction.

The Sample containers to be selected and examined separately for each lot for ascertaing their conformity to the specifications.

Prepared by **H O D**	Approved by **CEO**
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMMRP – 02]

d) Method for Selection.

i. Containers must be selected from the lot at random.

ii. When containers are packed in different boxes, a suitable number of boxes (10% of total number in the lot, min 02) to be first chosen at random. From each box an equal number of containers to be picked up from different areas to obtain the required number.

e) Scale of sampling and permissible number of defectives

No of Items in the lot	Sample	Sample Size	Common Size	Visual Sample Charactistics	
Up to 3000	1st	50	50	3	7
	2nd	50	100	8	9
3 – 10000	1st	80	80	5	9
	2nd	80	160	12	13
10 - 35000	1st	125	125	7	11
	2nd	125	250	18	19
35 - above	1st	200	200	11	16
	2nd	200	400	26	27

Remarks

i). Acceptance Number --> Maximum number of defective in the sample for permissible in a lot.

ii). Rejection Number --> Minimum number of defectives in the samples for rejection of the lot.

f) TESTING OF GHEE TINS

The following tests are carried out :

i) Visual inspection of tins is done for cleanliness, printing, quality, freedom from dust or moisture.

ii) Dimensions like diameter & weight are measured with appropriate instruments, thickness of the plate is measured with micrometer.

iii) Leakage test : The container is packed, seamed or closed without the content and immersed in hot water. Observation is made for bubble formation in order to detect leaks.

iv) Lacquer

1) Copper sulphate (5% in 1% HCl sol.) is applied on the lacquer coated surface with the help of a cotton pad. The surface is exposed to sun light for about 5 mts. and any change is observed. If the tin is properly lacquered, colour of the tin will not change to black or red . The application of lacquer is usually inspected for the presence of scratches and pinholes.
The following test is carried out.

2) To 100 ml of 1% potassium ferrocyanide is added 5 ml.of N/2 HCl. Strips of filter paper soaked in solution are spread on the lacquered surface at different places including seams and allowed to dry. Blue steaks or strips on the test paper indicate defective application of lacquer.

v) Collapse under vacuum and air pressure test.

The tin is to hold in frame and a rubber lined top screwed, down on its open end. Connect to vacuum pump & vacuum gauge through this top. Vacuum is gradually built up to 10" over a period of two mts. This is done by adjusting the cork on the line to the pump. The tin should not collapse at 10" vacuum. Similarly air pressure test is done using pressure pump. A tin used for ghee packing must withstand 0.15 kg./cm2 air pressure.

8.15.14 SPECIFICATIONS FOR 15 KG GHEE TINS,

15 Kg capacity square tin containers made out of 0.28 mm thickness of Prime Quality Electrolytic tin plate having minimum tin coating of 5.6 gm/sq (2.8 gm/m sqon each side) for packing ghee. Internally these are to be duly food lacquered and externally be printed in two colour as per our specifications.

The closure and components also to be manufactured from the same quality tin plates. 'D' shape handle manufactured of galvanized iron wire of not less than 3.5mm diameter. The weight of the tin container must not be less than 920 gms (min.). The tin must pass the following tests as prescribed in IS:10324:1982:

a) Air Pressure Test
b) Handle Pull Test
c) Hydraulic Pressure Test
d) Size: 237 x 237 x 325 mm

The Wt. of Tikli must not be less than 4 gms & must be embossed with company logo. Tins must be in clean condition from (internally & externally) from extraneous matter and traces of rust.Mouth of the tin must be closed with BOPP Tape.

8.15.15 SPECIFICATIONS FOR TWO LAYER METALLIC POUCHES,

a) Two Layer: The metallic pouch must be made of two layers.

i) Outerlayer - 10 micron polyester

ii) Laminated with 150 micron poly(combination of LDPE & LLDPE)

iii) Total GSM - 158

iv) Size - 17 X 28 CM.

The pouch must be sealed from three sides & open on top side. The compostion of LPDE & LLDPE must be in such a manner that there should not be any sealing problem. The pouch must be printed in 8 colours as per our design colour.

8.15.16 SPECIFICATIONS OF THREE LAYER METALLIC POUCHES,

a) Outer layer - 10 micron (Reverse printing) polyester (Base)

b) Laminated with 12 micron metallised polyester

c) Inner lamination with 120 micron poly(Combination of LDPE & LLDPE)

d) Total GSM - 150

e) Size - 17 x 28 CM.

The pouch must be sealed from three sides & open on top side. The composition of LPDE & LLDPE must be in such a manner that there should not be any sealing problem.

The pouch is to be printed in 8 colour's as per our colour design .

Note : Material to be wound on 70 mm plastic cores having an outer dia 220 mm and wooden dowels will be used to secure packaging in wooden boxes.

8.15.17 POLYTHENE FILM FOR PACKING OF GHEE (AGMARK) 1 ltr & ½ ltr

a) General Requirements

Co-extruded 5 layer nylon barrier film having composition LLDPE/BA/Nylon-6/BA/EAA (Primacor), cream pigmented suitable for packing Ghee under Agmark replica. Printed in two /four colours as per design on rotogravure printing machine using inedible ink. The film must have following characteristics:-

i. Thickness	: 100 +/- 10 microns
ii. Width of film	: 325 mm +/- 2 mm
iii. Tensile strength	: MD 200 kg/SQCM(IS:2508-1984) TD 150 kg/SQCM.
iv. Dart impact	: 200 GM: From a drop height of 152.4 cm(IS:2500-1984)
v. Seal strength	: 2.5 kg/15 mm
vi. Elongation	: Md 300%(IS:2508-1984) TD 350%
vii. MVTR	: Less than 5 GM/SQM/Day at 27 deg C , 65% RH

viii.Oxygen transmission : Less than 70 CC/SQM/Day/ atmosphere 27deg C,65% RH.

ix. Migration : Less than 10 MG/DM sq (IS: 11704 - 1986)

x. Yield : One kg. pouch-110-130 pouches/kg.film

---

b) The film must be duly Agmarked and approved by the Ministry of Agriculture, Govt. of India for printing of Agmark replica. It must be cleaned, free from pinholes, particles of foreign matter and undispersed raw material.

c) The texture and finish to be uniform, edges and surface of free from cuts and wrinkles. It is to be free from any extraneous odour.

d) The film is to be wounded on the core uniformly and with proper tension giving a perfect and trimmed edge. There must not be telescoping of film layers.

e) The filled pouches are to be tested and qualified to drop test, leak test and stack load test as per ISI.

f) The film should be manufactured in hygienic premises and a place free of insects.

8.15.18 SPECIFICATIONS FOR CROWN CORK,

a) The crown cork must be made from tin plate of minimum thickness of 0.24mm to 0.26mm & tamper grade of t4/t3.

b) The height of cork is to be 5.8 to 6.2 mm

c) The lining compund (PVC), if used must be virgin non-toxic,Food grade virgin and not to impart any perceptible odour to the contents & heat resistance at 150°C.

d) Crown cork must conform to IS-1994-1987 standards (As amended from time to time).

e) It weight must be in range of 2.2 to 2.4 gm.

f) Crown cork to be printed as per the matter, design & colour scheme decided from time to time.

8.15.19 SPECIFICATIONS OF MILK POUCH FILM,

a) General Requirements

Co-extruded multilayered, white pigmented film prepared from virgin 'A' grade quality grains. Film should meet the food grade requirement given in IS 10146:1982 and IS 10141:1982. The pigmented used should be from listed in IS 9833 :1981.

Combination: LDPE= 40%, LLDPE Butane = 28%, LLDPE Octane = 30%, Master Batch 2%

a) The film shall be uniform in texture and finish. The film shall be free from pin holes,streaks, particles of foreign matter, gauge variation band and undispersed raw material. There shall be no visible defect such as holes, tears or blisters. The film shall have even and wrinkle free surface.

b) The film shall be free from any type of odour.

Thickness :

A : 46-52 micron for 500 ml.

B : 56-62 micron for 1 L

Width Normal Width 323 mm + 2 mm

The film should pass the following tests:

A) Tensible Strength:

The tensible strength at break when tested as prescribed in A-4 of IS:2508:1984 shall not be less than 220 KgF /.cm2 in lengthwise direction & 200 KgF/Cm 2 in crosswise direction.

B) Elongation At Break

The clongation at break when tested as prescribed in A-4 of IS: 2508:1984 shall not be less than the following values Elongation At Break. MIN

Lengthwise %	Crosswise %
300	600

Dart Impact Resistance

When tested as per procedure given in A-6 of IS:2508:1984, obtained from the height of 66 cm shall not be less than 225.

Leak Test

The filled pouches after filling with milk at about 5 deg C & sealing shall not show any leakage.When subjected to uniform distributed load of MIN. 3.5 KgF for 500 ML.Pouch and 6 KgF for 1 Lt pouch.

Drop Test

Sixteen samples of filled pouches shall be taken randomly from filling line. The temperature of the filled pouches shall be maintained within +2 degree C of filling temperature of milk sample drawn above are shall be dropped from a height of 1.2 M on a flat, smooth surface. Each pouch shall be dropped four times in the following sequence

a) On Flate Side.
b) On opposite side.
c) On flat longer edge.
d) On opposite longer.

The samples shall be deemed to have passed the test if not more than 4 pouches burst in the test.

PRINTING REQUIREMENT

It should pass the following tests.

1. Apply 25 mm cello tape or wide transparent tape to the printed area of the pouch, one down the length of the pouch and other along the width. Press the tape firmly on the pouch and leave 15 seconds. Remove the tape by pulling slowly at about one end at about 90 degree C to the pouch surface. There shall be no removal of printing material from the surface of the pouch and printed material shall be readable.

2. Immerse a printed piece of film in milk and leave it for 12 hours at a temperature of about 8 degree C. After removing the film from the milk, wipe it with a cloth to dry it, rub the printed surface with tissue paper gently by hand. The ink removed from the print shall not be to the extent so as to reduce the printed matter not readable after the test.

MIGRATION TEST

The max. entration value for the contact layer shall not exceed 60 PPM (ISI : 9845 : 1981).]

GENERAL CONDITION:

A) The film should be thoroughly protected against contamination and manufactured to meet Hygienic standard laid for food processing Industry. The rolls should be thoroughly wrapped in polyliners for protection against dust and dirt.

B) Packed cartons shall be clearly labelled indicating Batch No., DT. of MFG, Gross Wt. and Net Wt. Weight of roll must not be more than 20 Kg (Incuding of core wt.).

C) If the monthly leakage during production, cold storage and transit comes to more than 01%. The same shall be compensated from you to the extent of landed cost of film

D) No of pouches (Good Pouches) [yield per kg.]
500 ml : 442 Nos (MIN)
1 lt. : 220 Nos (MIN)

SAMPLE SIZE FOR LDPE FILM
REFERENCE NO IS : 2508 – 1984

LOT SIZE	NUMBER OF ROLLS TO BE SELECTED	PERMISSIBLE NUMBER OF DEFECTIVES
1	1	0
2 – 15	2	0
16 – 40	3	0
41 – 65	5	0
66 – 110	7	0
111 – 180	10	0
181 – 300	15	1
301 – 500	25	1
501 – 800	35	2
801 – 1300	50	3
1301 & ABOVE	75	4

8.15.20 SPECIFICATIONS OF PLASTIC TRAYS (CRATES) FOR MILK POUCHES.,

a) " Prepack" plastic trays to hold 24 milk pouches of half litre capacity made out of High Density polyethylene/ PPCP of Virgin Quality with partition having following specifications:

DIMENSIONS :

	L (mm)	B (mm)	H (mm)
OUTER DIA.	471	378	170
INTERNAL DIA	427	335	155
WT. OF CRATE	1580 Gms + / - 2 %		

1. The milk crates must strictly conform to ISI specification ISI : 11584 - 1986 .
2. Generally there exists four resting points, two each on length sides, but in these trays, there must be FOUR resting points, two each on width sides also.

b) PPCP Milk Pouch Trays

Milk Pouch Trays made out of PPCP granules as per ISI specification No. is 11584 - 1986,

c) The colour of the Milk crate must be of green, duly screen printed with company Logo Milk-Time on both sides as per our design. Font must be in double colour.

8.15.21 SPECIFICATION OF GHEE POLY JAR

HDPE polyjar container of virgin & food material manufactured from blow moulding prime grade B-560003 of RIL for packing ghee duly printed as per our design.

Sr No	Size	Wt.of jar (with lid)
1	1/2 Ltr	38 ± 2 gms
2	1 Ltr	65 ± 2 gms
3	2 Ltr	115 ± 4 gms
4	5 Lt.	220 ± 5 gms

8.15.22 SPECIFICATION OF DAIRY WHITENER POLY JAR

HDPE polyjar container of virgin & food material manuffactured from blow moulding prime grade B-560003 of RIL for packing ghee duly printed as per our design.

No	Size	Wt.of jar (with lid)
1	200 Gms.	28+/-2 gms
2	500 Gms.	58+/-2 gms

i) Lids must be tightly closed.
ii) Printing must be bright & legible.
iii) Printing must be in two colours.
iv) Tape Test : Ink used for printing poly jars must pass the test.
v) Art work must be got approved before commercial production.

8.16 SPECIFICATIONS FOR GLASSWARE & ALLIED ITEMS.

8.16.1 SPECIFICATIONS FOR 12 HOLD BUTYROMETER SHAKING STAND

(A) Main Body (Stand + cover) : High Density Polythene Material

(B) Holding screws and clamped screw material : Stainless steel

(C Stand : Consisting three tires-one at base one in middle and one at top. Distance between two tires not to be more than 75 mm.

i) Length : 230.5 mm, Breadth 85 mm, Height 160 mm.
ii) Breadth : 185 mm.
iii) Height : 160 mm.

iv) Thickness of sheet : 3.5 mm

v) Thickness of supports : 3.5 mm

vi) Number of Holes : 12 with two rows of six each

vii) Dia (inner) of hole : 26.3 mm

viii) Distance between Holes : 6 mm minimum

8.16.2 TOP COVER FOR SECURING OF BUTYROMETER IN POSITION FOR SHAKING

a) Length (outer) 240.5 mm
b) Breadth (outer) 91 mm
c) Height 121.0 mm
d) Length of hole for sliding clamp screw 87 mm
e) Breadth of hole for sliding clamp screw 10 mm
f) Edge on underside of top cover (lengthwise) 8 mm

g) 19 mm X 6 mm clamp screw with minimum 11 mm Head to be used.

h) Gross weight of the stand With top cover 325 gm +/-10 with top cover.

8.16.3 SPECIFICATIONS OF BUTYROMETER (ISI MARKED)

a) Purpose: To determine the fat content of milk accuratly.

b) Requirements Butyrometers, 10 percent scale (ISI Marked)

c) Material : The butyrometers to be made from clean borosilicate glass (type 1 with a co-efficient of linear thermal expansion of 33x10 -7 degree C, resistant to chemicals and to the thermal shocks incidental to the method. The butyrometers to be well annealed and free from stones, blisters, cracks and from bubbles and other visible defects.

d) Inscriptions: Each butyrometer must have permanently and legibly itched on the body:

i) 10.75 ml milk
ii) 65 degree C.
iii) Maker name
iv) Identification No and
v) ISI mark.

e) Other specifications : The shape, dimensions (including wall thickness), neck, body, graduated tube bulb, graduations to be as per IS: 1223-1982 with latest amendments if any.

8.16.4 SPECIFICATIONS FOR MILK PIPETTES (ISI MARKED),

a) Purpose — To measure the milk for its fat content, determination by Gerber method.

b) Requirement — 10.75 ml pipette (ISI marked)

c) Material: — The pipettes must be made from stout walled borosilicate glass tubing. The pipettes are to be well annealed and free from stones, blisters crackes and from bubbles and other visible defects.

d) Capacity — The capacity of the pipette to be 10.75 +/- 0.03 ml and determined by the volume expressed of water at 27 deg C expressed in ml. delivered by the pipette when emptied as per standard procedure prescribed in IS: 1223-1982.

e) Delivery time: — The delivery time to be 7 +/- 2 seconds.

f) Inscriptions — Each pipette must have the following information permanently and legibly itched on it:-
i) Milk
ii) 10.75 ml
iii) 27 deg C
iv) Maker's name
v) Identification Nos.
vi) Graduation mark for 10.75 ml
vii) ISI mark.

g) Other specification — The General design, suction tube, graduation mark, bulb delivery jet & other dimensions (including wall thickness) are to be as per IS: 1223-1982 with latest amendments , if any.

8.16.5 SPECIFICATIONS FOR LOCK STOPPER.,

A) Lock Stopper (ISI Mark)

a) Purpose — To fit in the neck of the butyrometer while determining fat %age of milk by gerber method.

b) Material: — The stopper to be made from acid resistant soft rubber having 38 +/- 5 international rubber hardness degree.

c) Suitability tests: — Lock stopper must be tested for its suitability by the method given below:-

i) Carry out six Gerber determinations according to the method prescribed in IS: 1224 (Part-1) 1977 Remove and keep the butyrometers intact in a stand for 48 hours so that stopper is in contact with sulphuric acid. There after remove the stopper from the butyrometer and wash it thoroughly with water.

Carry out six more tests with the stoppers as prescribed above to ascertain that no physical damage has been done to the rubber part of the stopper and there is no change in elasticity of rubber.

d) Marking: — Each stopper to be marked with manufacture name and ISI Mark. Each carton must be marked with the following information:

i) Manufacturer's name
ii) Number of stoppers
iii) Identification number
iv) Date of manufacture

e) Other Specifications : The dimensions and other specifications must be as per IS: 1223-1982 with latest amendment if any.

B) Lock Stopper (Non ISI Mark)

Lock stopper must meet all the detailed specifications, suitable tests and accuracy of ISI 1223-1982.

8.16.6 SPECIFICATIONS FOR LOCK STOPPER KEY

a)	Purpose	To insert/remove the lock stopper in / from the butyrometer and to adjust the fat column while reading the fat percentage.
b)	Material	Aluminium (anodysed)
c)	Markings	Lock-stopper Key to be marked with maker's name.
d)	Other specifications:	The dimensions and other specification shall be as per IS: 1223-1982 with latest amendments if any.

8.16.7 SPECIFICATIONS FOR MILK SAMPLE BOTTLE,

a)	Purpose	To collect and preserve raw milk samples.
b)	Material	High density polyethylene
c)	Capacity	300 ml
d)	Weight	50 gms +/- 1 gm
e)	Other specifications	Dimensions and other speci fications as per enclosed drawing.

8.16.8 SPECIFICATIONS FOR BRUSHES (MILK PIPETTE),

a)	Purpose	To clean Milk Pipette
b)	Material	Filling material to be of Nylon monofilaments of 0.20 +\-0.02 mm dia (conforming to IS: 1843-1963). Holding wire to be soft G.I. wire of 1.25 +/- 0.15 mm diameter and fixing wire be of soft G.I. wire of 0.45 +/- 0.05 mm dia.
c)	Marking:	Each brush is to carry a tag which must be legibly and indelibly marked or stamped the manufacturer's name or trade mark if any, type, size and year of manufacture.
d)	Other Specification:	Shape and design dimensions, mass and tolerence, finish & other specification to be as per IS:9659-1980, with latest amendments if any.

NOTE : Brushes are also to pass full test and mass of filling material for finished Brush as per IS: 9657-1980.

_8.16.9 SPECIFICATIONS FOR BRUSHES (MILK SAMPLE BOTTLE) ,

a)	Purpose	To clean milk sample bottle
b)	Material:	Filling material to be of nylon monofilaments of 0. 0350 +/- 0.025mm diameter (conforming to IS 1843-1963). Holding wire to be soft GI wire of 1.0 +/- 0.2mm diameter. Fixing wire to be soft GI wire of 0.50 +/- 0.05 mm diameter.
c)	Marking:-	Each brush is to carry tag which must be legibly and indelibly marked or stamped the manufacturer's name or trade mark if any, type,size and year of manufacture.

d)	Other specifications:	Shape and design, dimensions, finish and mass and tolerances, workmanship and other specifications to be be as per IS: 9658-1980 with latest amendments if any. Brushes are also to pass full test and mass of filling material for finished brush as per IS: 9658-1980.

8.16.10 SPECIFICATIONS FOR MILK COLLECTION TRAY

a)	Purpose	To enable the milk collector to pour the milk directly into the can through strainer and to measure it quickly.
b)	Material	22 gauge galvanized M.S.Sheet.
c)	Marking	To have the maker's name and identification No.
d)	Other specifications	Dimensions and other specifications and to be as per drawing.

P.S. Indicate the weight of the Milk Collection Tray in the quotation.

8.16.11 SPECIFICATIONS FOR FUNNELS

6" dia funnels made of Acid resistant Plastic (Virgin white) of 1 mm thickness)

P.S. Indicate weight of the funnel in the quotation.

_8.16.12 Specifications For Sampling Dipper 50 ml. ,

1)	Purpose	To draw the milk sample for testing .
2)	Material	Aluminium anodysed
3)	Marking	To have maker's name and identification no.

4) General — The dipper is to have a dip and the handle bent over. The arc of the inside bottom corner of the sampling dipper to be defined to assure proper cleaning. The body of the sampling dipper is to be of one piece construction with no seams over laps, rivets or sharp corners.

8.16.13 SPECIFICATIONS FOR TILT MEASURE 10 ML (FOR CORK NO.4 & 9)

a) Purpose — To measure 10 ml of sulphuric acid for determination of fat content in milk by Gerber method.

b) Material — The automatic measures made from clear borosilicate glass These are to be well annealed and free from stones,blisters,cracks and bubbles and other visible defects.

c) Capacity tolerance — The capacity of the tilt measures for sulphuric acid at 27 degree C shall be 10.0 +/-0.25 ml.

d) Marking — Each tilt measure shall have the following information permanently and legibly marked on it.
   a) 90% sulphuric acid
   b) 10 ml
   c) Identification numbers.

e) Other Specifications: — The tilt measure must be complete with acid resistant hard rubber bung. The dimensions and other specifications must be as per IS: 1223-1982 with latest amendments if any.

8.16.14 SPECIFICATIONS FOR TILT MEASURE (1 ML) (FOR CORK NO.4 & 9),

a) Purpose — To measure 1 ml of Amyl Alcohol for determination of fat content in milk by Gerber method.

b)	Material	The automatic measures must be made from clear borosilicate glass. These are to be well annealed and free from stones,blisters, cracks, and from bubbles and other visible defects.
c)	Capacity tolerance	1.0 +/- 0.05 ml.
d)	Marking	Each tilt measure must have the following information permanently and legibly marked on it: 1. Amyl Alcohol 2. 1 ml
e)	Other specifications:	The tilt measure to be complete with hard rubber bung. The dimensions and other specifications shall be as per IS: 1223-1982 with latest amendments, if any.

8.16.15 SPECIFICATIONS FOR BUTYROMETER CLEANING BRUSH

a)	Purpose	To clean the butyrometer
b)	Material	Filling material to be of nylon monofilaments of 0.20 +\- 0.02 mm dia (conforming to IS: 1843-1963) Holding wire to be soft GI wire of 1.00 +/- 0.10mm diameter and fixing wire to be of soft GI wire of 0.45 +/- 0.05mm diameter.
c)	Marking	Each brush to carry a tag which must be legibly and indelibly marked or stamped with the manufacturer's name or trade mark, if any, type, size and year of manufacture.
d)	Other specifications:	Shape & design, dimensions, mass and tolerance, work and finish and other specifications must be as per ISI: 9659-1980 with latest amendments, if any. Brushes must pass full test and mass of filling material for finished brush as per IS:9659- 1980

8.16.16 SPECIFICATIONS FOR CENTRIFUGAL MACHINE

a) General :- The centrifuges may be hand driven or electric driven.

b) Material :- The material used for constructions of various parts of the centrifuge must be such that these are capable of withstanding the maximum stress for desires purposes and must have adequate corrosion resistance under the conditions of service.

c) Design :- The design of the centrifuge to be such that the temp. of the contents of the butyrometer after centrifuging is between 30 to 50 deg. C.

d) Speed Indicator :- The centrifuge to be provided with speed indicator which indicate the number of revolutions per minute. The speed indicator to be have maximum tolerance of + 50 rev. / minute in its reading.

e) Speed :- The centrifuge to be capable of producing within 2 minutes when fully loaded, a relative centrifugal acceleration of 350 + 50 g. at the outer end of butyrometer stopper.

8.16.17 SPECIFICATIONS FOR ALUMINUM ALLOY MILK CAN

a) Aluminum milk can capacity 40 ltrs. to be made from Aluminum alloy. It must conform to ISI : 1825 - 1983 and latest amendments if any.

b) Material

c) Body & lid must be made from sheet of Aluminum alloy conforming to ISI specifications 64430(HS-30) of IS:737-1974 with copper content as near as possible to 0.05%

d) Handles and Ears for handles

These must be made from extruded section of aluminum alloy conforming to ISI specification 64430(HE-30) of IS 733-1975. Ears for the handles may also be made from sheets & strip of Aluminum alloy conforming to ISI designation 64430(HS-30) of IS:737-1974.

e) Shape & Dimensions
These are to be manufactured in accordance with the shape & dimension mentioned in IS:1825:1983

f) Minimum Thickness for different parts of Finished can is to be as under

i) Body & neck : 2.0 mm
ii) Bottom : 3.0 mm
iii) Lid (inner) : 1.8 mm
iv) Lid (outer) : 1.8 mm

g) Mode of Shaping

One - Piece Can : The one piece (monobloc) can to be manufactured by means of processing, deep drawing and subsequent spinning. Extra thickness at shoulder to be provided during shaping for additional strength

h) Workmanship & Finish

All brazing or welding must be sound, free from porosity of adequate strength to withstand normal use and to be finished smooth to provide sanitary finish to all the inner surface.

i) The Mass of 40 Ltrs can including lid must be minimum 6.5 kg.

j) The can when immersed in water & subsequent subjected to internal air pressure of 70 KPA for five Mts. shall show no sign of leakage or any other damage during or after the test.

k) Can filled to the rated capacity (up to neck with water and with lid are to be held in vertical position & dropped once vertically from the ht. of 125cm on a horizontal hard concrete floor or steel surface. The cans neither to show any leakage nor suffer from any damage other than denting.

l) Marking : 40Ltr mark on circumference both inside and outside the can. Each can must be embossed and serialed as under :

a) Words to be embossed : Milk Time
b) Size of Words : 2.5 inch.
c) Placement on can : Chest of can

m) Sr.No. must be embossed in five digital

8.16.18 SPECIFICATIONS FOR JERRY CANS

a) Heavy duty Jerry Cans in Black color, made out of virgin high density polyethylene,stackable type, with lid, cap and suitable for filling / storing / transportation of Concentrated Nitric Acid and Sulphuric Acid.

Sr No Capacity	30 litters	20 litters	10 litters
1. Weight	2.0 kg + / - 5 %	1.2 kg + / - 5 %	800 gms + / - 5 %
2. Dimensions	48 x 36 x 24 cm	46.5 x 33 x 17 cm	34 x 27 x 16 cm
3. Mouth dia	50 mm	50 mm	31 mm

SAMPLE SIZE FOR ALUMINUM CAN

Reference No. : IS : 1825 - 1983

Number of Can in a lot	For visual & Dimensional requirement		For Thickness
	No of Can Selected	Permissible no of defective Can	
3 to 25	3	0	1
26 to 100	5	0	1
101 to 300	8	0	2
301 to 500	13	1	2
501 to 1000	20	1	3
1001 to 3000	32	2	3
3001 to above	50	3	5

8.16.19 SPECIFICATIONS FOR DAIRY WHITENER JAR.

Milk Time Dairy Whitener Jar must be manufactured from virgin grade (food grade) H.D.P.E., printed in double color on single side as per design / art work. The Polyjar must be in white color and lid (also made from virgin grade HPDE) in blue color. The jar must be provided with steel handle.

1. Polyjar Size : 10 Kg.
2. Weight : 460 ± 10 gm.
3. Cap Weight : 50 ± 05 gm.
4. Handle weight : 40 ± 05 gm.

The Polyjar shall be packed in polyfilm of min. 30 micron thickness.

The art work must be got approved before commercial production.

8.16.20 SPECIFICATIONS OF FORMALDEHYDE SOLUTION

A colorless liquid with characteristic pungent and irritating odor, A slight white cloudy deposit is formed on long standing,especially at low temps.

1. Acidity as HCOOH% by mass (max.) - 0.05%
2. Aldehyde content as HCOOH % - 37 +/- 0.5
3. Ash % by mass (max.) - 2.0
4. Methanol content % by mass - 4 TO 6

8.16.21 SPECIFICATIONS OF STABILIZED HYDROGEN PEROXIDE

Material must be in the form of clear , colorless liquid , free from suspended impurities and dust particles conforming to ISI grade.

1. Strength by mass - 50%

8.16.22 SPECIFICATIONS OF NITRIC ACID (HNO3)

Clear, colorless, fuming liquid conforming to ISI TECHNICAL GRADE

1. Specific gravity - 1.41 to 1.42
2. Total acidity (as HNO3) % by mass (min.) - 52
3. Residue on ignition % by mass (max.) - 0.1

8.16.23 SPECIFICATIONS OF SULPHURIC ACID (COMM.)

1. Color - A colorless clear solution
2. Specific gravity - 1.82 to 1.84
3. Strength % by mass (Min) - 98 %
4. Suitability for milk analysis - Shall pass the test analysis

8.16.24 SPECIECIFICATIONS OF CITRIC ACID (Food Grade)

1. Color - Colorless,transluscent crystal
2. Odor - Odorless
3. Taste - Acidic
4. Strength - 99% (Min.)

8.16.25 SPECIFICATIONS OF BLEACHING POWDER

1. Color - White to slightly yellowish white free from hard lumps
2. Available cl2 present by weight (min.) - 35%
3. Moisture % by weight (max.) - 0.3

8.16.26 SPECIFICATIONS OF CAUSTIC SODA

1. Color - Clear white flakes free from moisture & lumps
2. Purity - 99% (Min)

8.16.27 SPECIFICATIONS OF ACETIC ACID

1. Color - Clear white
2. Specific Gravity - 1.048 to 1.051
3. Purity - 99 %

8.16.28 SPECIFICATIONS OF FERRIC ALUM

1. Purity (As soluble aluminum compound) - 7.5 %
2. Acidity - Not more than 1.5 %
3. Soluble iron compound (% by mass) (MAX.) - 0.3

8.16.29 SPECIFICATIONS FOR THE PACKAGING MATERIALS USED IN ICE CREAM

SR NO	PARTICULARS	SIZE	REMARKS
1.	Plastic Cups (100 ml)	Out Dimensions Top = 80 mm Bottom = 60 mm Height = 38 mm	HIP plastic food grade cups, printed in two colours as per the design supplied by us. The weight should not be less than 3 grams. It should have clear, bright printing of all written maters, supplied.
2.	Family Pack	500 ml 151 mm x 113 x 30 mm	White Duplex board of 330 having food grade paraffin was coating of 25 microns at inner surface, and outer surface has to be laminated with PVC of 10 – 12 microns, printed in multicolor of offset machine as per our color scheme.

8.16.30 SPECIFICATIONS OF MALTODEXTRIN POWDER

TASTE/FLAVOUR	-	NORMAL
COLOUR (10% SOL.)	-	CLEAR WHITE
pH	-	6.5 - 6.8
MOISTURE %	-	4.0 (MAX)
BD	-	0.55 (MIN.)
DEXTROSE EQUIVALENT %	-	NOT MORE THAN 20
SPC/g	-	20,000 (MAX)
COLI/0.1G	-	NIL

8.16.31 SPECIFICATIONS OF ISO AMYL ALCOHOL (ISI GRADE)

1.	Color	Clear and colorless
2.	Water content	Shall pass the test
3.	Solubility in water	Shall pass the test
4.	Distillation range	Not less than 95 ml within 2 degree in the range 128 to 132 deg. C
5.	Furfurl & other	Shall pass the test
6.	Suitability for milk analysis	Shall pass the test
7.	Hydrochloric acid test	Shall pass the test

8.17 ANALYSIS FOR EFFLUENT WATER

8.17.1 OIL AND GREASE

a) Apparatus
   - i) Separating funnel
   - ii) Glass or porcelain dish
   - iii) Water bath
   - iv) Analytical balance

Separating Funnels
500 ml.capacity. The stopper or stop cork must not be lubricated with matter soluble in petroleum ether.

b) Reagents
   - i) Dilute Hydrochloric Acid - 1 : 1,
   - ii) Light petroleum(Petroleum Ether) Boiling range 40 – 60 deg.C
   - iii) Methyl Orange Indicator solution (1%)

c) Procedure

i) Place the sample, usually 250 ml.in the Separating Funnel.

ii) Acidify the sample with the dilute Hydrochloric acid (2 ml).

iii) Add a few drops of Methyl Orange indicator solution.

iv) Rinse the sample bottle carefully with 10 ml.of petroleum ether and add the ether washings to the separating funnel.

v) Add an additional 10 ml.of ether to the separating funnel, shake vigorously for two minutes and allow the ether layer to separate.

vi) Withdraw the colored aqueous portion of the sample into a clean beaker.

vii) Return the aqueous portion of the sample to the separating funnel, rinsing the beaker with 5 ml. of ether.

viii) Add the ether washing & an additional 10 ml. ether to the separating funnel, and agitate for another two minutes. Allow the solvent layer to separate and discard the aqueous phase.

ix) Collect the ether layer into a pre weighed tarred dish.

x) If a clear ether layer cannot be obtained, filter the solvent layer through a funnel containing an ether moistened filter paper (Whatman No. 40 or equiv.).

xi) Wash the filter paper with some petroleum ether, evaporate the ether extract on a water bath or an electric heating mantle, keeping the heat source at about 70 deg.C.

xii) Cool down the dish in the dessicator and weigh it.

d) Calculation :

$$\text{Oil \& Grease (mg/1)} = \frac{1000\ W}{V}$$

Where

W = Weight in mg.of the residue in the beaker and
V = Volume in ml.of the sample taken for the test.

List of Equipment

8.17.2 TOTAL SUSPENDED SOLIDS

a) Apparatus

i) Funnel - Size 65 mm.
ii) Measuring Cylinder (50 ml and 100 ml capacity Borosil)
iii) Beaker (250 ml capacity)
iv) Oven having temperature control +/- 1 deg.C (Temp. Range 0 - 250 deg.C)
v) Dessicator
vi) Analytical balance .

b) Procedure

i) Take a filter paper (Whatman No. 42)

ii) Dry it in oven at 105 +/- 1 deg.C. for 1 hour.

iii) Cool it in dessicator to a constant weight.

iv) Now take 50 ml of well mixed sample. If suspended solids are of low range, take 100 ml sample and filter it.

v) Dry the filter paper alongwith residue in the oven at 105 deg.C +/- 1 deg.C for 1 hour.

vi) Cool and weigh it to a constant weight. If it does not give constant weight, repeat the drying and cooling process.

c) Calculations :

$$\text{Total suspended solids} = \frac{1000\ W}{V}\ \text{mg/l}$$

Where :
W = Weight in mg.of the suspended matter.
V = Vol. of the sample filtered.

Total suspended solids = Total solids- Total Dissolved solids.

8.17.3 TOTAL DISSOLVED SOLIDS

a) Appratus

i) Pipette (10 ml and 25 ml capacity)
ii) Evaporating dish
iii) Funnel
iv) Measuring cylinder (50 ml and 100 ml capacity Borosil)
v) Beaker (250 ml capacity)
vi) Oven having temp. control +/- 1 deg.C (Temp. range 0 - 250 deg.C)
vii) Dessicator
viii) Analytical balance.

b) Procedure

i) Take an evaporating dish. Dry it in oven at 105 deg. C + / - deg C for one hour.
ii) Cool and weigh it to a constant weight.

iii) Filter 50 ml of sample through Whatman filter paper No. 42.

iv) Take 10 ml. filtrate in the evaporating dish, keep on a water bath till almost dry and then transfer it to the oven maintained at 105 deg.C+/- 1 deg.C.

v) When it evaporates completely,(one hour). transfer to dessictor, cool and weigh .

c) Calculations :

$$\text{Total dissolved solids} = \frac{1000\ W}{V}\ \text{mg/l}$$

Where :
W = Weight in mg. of the residue left.
V = Vol. of the sample taken for evaporation.

8.17.4 DETERMINATION OF CHEMICAL OXYGEN DEMAND,

REQUIREMENT :

1. Reflux apparatus consisting of Erlimmeyer flask.
2. Condenser.
3. Cylinder capacity 50.0 ml.
4. Bulb pipette capacity 10.0 ml.
5. Bulb pipette 2.0 ml.
6. Graduated pipette 1.0 to 10.0 ml.
7. Spatula.

REAGENT :-

1. Standard Potassium Dichromate Solution :
   Dissolve 12.25 gms of Potassium Dichromate (K2Cr2O7) dried at 105 C for two hours in distilled water and dilute to 1liter.
2. Silver Sulphate.
3. Conc. Sulphuric acid.
4. Sulphuric Acid Reagent :
   Add 22 gms of Silver Sulphate to 4Kg of Sulphuric Acid.
5. Standard Ferrous Ammonium Sulphate 0.25N.

Preparation of Ferrous Ammonium Sulphate :(FAS)

==========

Dissolve 98 gms of Ferrous Ammonium Sulphate in distilled water. Add to it 20 ml conc.H2SO4. Cool and dilute to 1000 ml. Standardize this solution daily as follows.
Standardization of Ferrosus Ammonium Sulphate

==========

Dilute 10 ml standard pottasium dichromate to 100 ml Add 30 ml of conc. H2SO4 and cool. Titrate with ferrous ammonium sulphate using 0.1 to 0.15 ml of ferroin indicator. Calculate the normality of ferrous ammonium sulphate as follows :-

Normality of (F.A.S) :- 0.25 N vol. of k2Cr2O7 /vol.of ferrous ammonium sulphate used in titration (ml)

6. Ferroine Indicator solution.
7. Mercuric sulphate reagent.

PROCEDURE

1. Place 20 ml suitable diluted sample in 250 ml reflux flask.

2. Add 1 gm mercuric sulphate (HgSO4) and add several glass beads & very slowly add 5 ml sulphuric acid reagent with mixing to dissolve mercuric sulphate. Cool while mixing to avoid possible loss of volatile material.

3. Add 12.5 ml 0.25 N Potassium dichromate solution and mix.

4. Add remaining 32.5 ml conc. sulphuric acid reagent through open end of condenser.

5. Reflux for two hours, cool & wash down condenser with approximately 75 ml of distilled water.

6. Disconnect the flask from condenser.Titrate with ferrous ammonium sulphate using ferroin indicator.End point is yellow to wine red.

CALCULATIONS :-

COD mg/l = (A - B) * N * 8000/ ML of sample

A = Volume of FAS used for blank (ml)
B = Volume of FAS used for sample (ml)
N = Normality of FAS

8.17.5 BIOCHEMICAL OXYGEN DEMAND (BOD),

a) Appratus

i) BOD bottles of 300 ml capacity
ii) Incubator having temperature control at 20 deg.C facility.

b) Reagents

i) Phosphate buffer solution

Dissolve 8.5 gms.of Potassium dihydrogen phosphate (KH2PO4), 21.75 gms.of dipotassium hydrogen phosphate (K2HPO4), 33.4 of disodium hydrogen phosphate (Na2HPO4.7H2O), and 1.7 gm.of ammonium chloride (NH4Cl) in 500 ml of water and dilute to one litter. The pH of this solution should be 7.2

ii) Magnesium Sulphate Solution

Dissolve 22.5 gms.of magnesium sulphate (MgSO4.7H2O4) in water and dilute it to one liter.

iii) Calcium Chloride Solution

Dissolve 27.5 goof anhydrous calcium chloride in water and dilute to one liter.

iv) Ferric Chloride Solution

Dissolve 0.25 gms.of ferric chloride in water and dilute to one liter.

v) Manganous Sulphate Solution

Dissolve 480 gms. of MnSO4.4H2O in distilled water. Filter it (if not clear) and make the volume upto one liter. The solution must not liberate more than a trace of iodine when added to an acidified potassium iodide solution.

vi) Alkaline iodide solution

Dissolve 500 gms. of NaOH (or 700 gms. of KOH) in its own weight of water and allow to cool, dissolve separately 150 gms.Potassium dichromate (KI) in a small quantity of freshly boiled and cooled water, add to it caustic solution and dilute to one liter.

vii) Conc. Sulphuric Acid

viii) Standard 0.025 N Sodium-thiosulphate soln.:

Dissolve 6.25 gms. of Na2S2O3 in small quantity of water and make the total volume upto one liter. This solution must be standardized with potassium dichromate solution.

ix) Starch Indicator solution

Add 5 gms.of starch and 0.01 g. of mercuric iodide with 30 ml of cold water and slowly pour it with stirring into one liter of boiling water, stirring continuously, boil for three minutes. Allow the solution to cool and decant off the supernatant clear liquid.

x) Sodium Sulphite soln.

Dissolve 1.5 g of anhydrous sodium sulphite in one litter of distilled water. Prepare fresh solution daily for use.

xi) Dilution water

Distilled water of good quality, free from metals, particularly copper, and aerated (Aerate for three to four hours).

xii) Seeding Material

Supernatant liquor of domestic sewage stored for 24 to 36 hours at 20 deg.C

b) Procedure

i) pH of every sample must be adjusted to 7.0 with sodium hydroxide solution or hydrochloric acid respectively.

ii) Sample must be dechlorinated, if chlorine is not dissipated on standing for two hours. To dechlorinate, first determine the quantity of sodium sulphite solution required for a known aliquot of the sample by titration to starch iodide end point after acidifying the sample with acetic acid (1:1) or sulphuric acid (1:50) followed by 10 ml of 10% potassium iodide solution. Then add to the requisite volume of the sample to the pre-determined quantity of sodium sulphite, avoiding any excess, and check the absence of chlorine after 20 minutes.

iii) Store the distilled water and sewage at 20 deg.C and use when near that temperature.

iv) Take the desired volume of water required for the sample, and to every one litter of water, add 1 ml. each of phosphate buffer solution, magnesium sulphate solution, calcium chloride solution and ferric chloride solution.

v) Seed the dilution water with seeding material (0.1 to 1 percent of settled sewage). Addition must be such that oxygen depletion in the dilution water control is between 0.2 and 1.4 mg/1, after incubation at 20 deg.C.for five days.

vi) Take two or three one litter capacity measuring flasks. Fill one upto 1000 ml mark with dilution water.

vii) Transfer it into two BOD bottles. Fill them completely, place stopper carefully without entraining air bubbles. This will be used as blank.

viii) Take appropriate sample, usually according to COD values, in another flask. Pour dilution water in it and make upto 1000 ml.

ix) Mix it by gently inverting the flask many times.

x) Now fill two BOD bottles and place them as described in case of blank. Water seal all the bottles and incubate for five days at 20 deg. C.

xi) Treat other dilutions,as mentioned earlier.

xii) Now add 1.5 ml of manganous sulphate solution followed by 1.5 ml of alkaline iodide solution, keeping the tip of the pipette well below the surface of the liquid.

xiii) Carefully replace the stopper without the inclusion of air bubbles and mix thoroughly the contents by inverting and rotating the bottle several times; allow the precipitate formed to settle.

xiv) When all the precipitate settles leaving a clear supernantant above the manganese hydroxide flocks, repeat the mixing for second time and allow to settle.

xv) When further settling produces at least 100 ml supernantant carefully remove the stopper & immediately add 2 ml of Conc. sulphuric acid by running it down the neck of the bottle, re-stopper and mix well to ensure uniform distribution of iodine in the bottle.

xvi) Take 200 ml of the solution and titrate immediately against standard sodium thiosulphate solution, adding 1 ml of starch indicator solution, when the color becomes pale yellow and completing the titration to the disappearance of the blue color. Repeat for both sample and the blank solution taken from incubator after five days kept at 20 deg.C

c) Calculations :

$$\text{Biochemical oxygen demand} = \frac{(A-B) - (C-D)}{V} \times 1000 \text{ (mg/l)}$$

Where :-

A - Initial dissolved oxygen content of the diluted sample.
B - Dissolved oxygen content of the diluted sample after incubation.
C - Initial dissolved oxygen content of the seeded dilution water (Blank)
D - Dissolved oxygen content of the seeded dilution water after incubation.
V - Volume of the sample used for test.

6. QUALITY RECORDS

6.1 Quality records in the department are kept as per common procedure issued by M.R. office.

6.2 List of Quality Records is given as under

QR-QA- 01 OF 01

DEPARTMENT : QUALITY ASSURANCE CODE : QMQ

SR. NO.	PARTICULARS	FORMAT FILE NO.	ITEM CODE	LOCATION CODE	RETENTION PERIOD
1	RAW MILK ANALYSIS	QMQ-01	IBI\QA\R\RM\01	IBI\QA\CL\FR-1\SL-01	4 YEARS
2	TANK POSITION	QMQ-02	IBI\QA\R\TP\02	IBI\QA\PL\FR-4\SL-01	1 YEAR
3	MILK SEPARATION	QMQ-03	IBI\QA\R\MS\03	IBI\QA\PL\FR-4\SL-02	1 YEAR
4	LIQUID MILK ANALYSIS	QMQ-04	IBI\QA\R\LM\04	IBI\QA\PL\FR-4\SL-03	2 YEARS
5	INDIGENOUS PRODUCT ANALYSIS	QMQ-05	IBI\QA\R\IP\05	IBI\QA\CL\FR-1\SL-02	1 YEAR
6 (A)	SKIM MILK POWDER ANALYSIS	QMQ-6(A)	IBI\QA\R\SMP\6A	IBI\QA\CL\FR-2\SL-01	3 YEARS
6 (B)	DAIRY WHITENER ANALYSIS	QMQ-6(B)	IBI\QA\R\DW\6B	IBI\QA\CL\FR-2\SL-02	2 YEARS
6 (C)	WHOLE MILK POWDER ANALYSIS	QMQ-6(C)	IBI\QA\R\WMP\6C	IBI\QA\CL\FR-2\SL-03	2 YEARS
7	GHEE ANALYSIS	QMQ-07	IBI\QA\R\GH\07	IBI\QA\CL\FR-1\SL-03	2 YEARS
8	BUTTER ANALYSIS	QMQ-08	IBI\QA\R\BA\08	IBI\QA\CL\FR-1\SL-04	2 YEARS
9	GRAVIMETERIC ANALYSIS	QMQ-09	IBI\QA\R\GR\09	IBI\QA\CL\FR-2\SL-04	2 YEARS
10	PACKING MATERIAL/ CHEMICAL ANALYSIS	QMQ-10	IBI\QA\R\PM\10	IBI\QA\ML\FR-3\SL-01	3 YEARS
11	MILK POWDER BACTERIOLOGICAL ANALYSIS	QMQ-11	IBI\QA\R\MPB\11	IBI\QA\ML\FR-3\SL-02	3 YEARS
12	BACTERIOLOGICAL ANALYSIS OF	QMQ-12	IBI\QA\R\IPB\12	IBI\QA\ML\FR-3\SL-03	1 YEAR
	INDIGENOUS PRODUCT				
13	AIR ENVIORNMENT & EMPLOYEE'S HYGIENE	QMQ-13	IBI\QA\R\AF\13	IBI\QA\ML\FR-3\SL-04	1 YEAR
	BACTERIOLOGICAL ANALYSIS				
14	PLANT STERILITY	QMQ-14	IBI\QA\R\PS\14	IBI\QA\ML\FR-3\SL-05	1 YEAR
15	EFFELUENT ANALYSIS	QMQ-15	IBI\QA\R\EA\15	IBI\QA\CL\FR-2\SL-05	2 YEARS
16	OUTWARD GATE PASS	QMQ-16	IBI\QA\R\GP\16	IBI\QA\CL\FR-1\SL-06	1 YEAR
17	RAW MILK CLEARANCE SLIP	QMQ-17	IBI\QA\R\RMC\17	IBI\QA\CL\FR-1\SL-07	1 YEAR
18	SFM SHELF LIFE	QMQ-18	IBI\QA\R\SFM\18	IBI\QA\ML\FR-3\SL-06	2 YEARS
19	LINE TESTING OF MILK PRODUCT	QMQ-19	IBI\QA\R\LT\19	IBI\QA\ML\FR-3\SL-07	1 YEAR
20	BACTERIAL CULTURE ACTIVITY REPORT	QMQ-20	IBI\QA\R\BC\20	IBI\QA\ML\FR-3\SL-08	1 YEAR
21	(A+B) WEIGHTMENT REGISTER	QMQ-21	IBI\QA\R\WT\21	IBI\QA\CL\FR-2\SL-06	1 YEAR
22	DETAILS OF COMPLAINT RECORD	QMQ-22	IBI\QA\R\CR\22	IBI\QA\ML\FR-3\SL-11	2 YEARS
23	RICE HUSK ANALYSIS	QMQ-23	IBI\QA\R\RH\23	IBI\QA\CL\FR-1\SL-08	2 YEARS
24	SMALL PACKING ANALYSIS	QMQ-24	IBI\QA\R\SP\24	IBI\QA\CL\FR-2\SL-07	2 YEARS
25	ICE CREAM ANALYSIS	QMQ-25	IBI\QA\R\IC\25	IBI\QA\CL\FR-2\SL-08	2 YEARS
26	COLD STORAGE TEMPERATURE	QMQ-26	IBI\QA\R\CST\26	IBI\QA\PL\FR-4\SL-04	1 YEAR
27	GLASS WARES TESTING REGISTER	QMQ-27	IBI\QA\R\GW\27	IBI\QA\CL\FR-2\SL-09	1 YEAR
28	MBR REPORT	QMQ-28	IBI\QA\R\MBR\28	IBI\QA\CL\FR-1\SL-05	1 YEAR
29	R & D REGISTER	QMQ-29	IBI\QA\R\R&D\29	IBI\QA\ML\FR-3\SL-09	5 YEARS
30	DAILY QUALITY ASSURANCE REPORT	QMQ-30	IBI\QA\R\QAR\30	IBI\QA\CL\FR-2\SL-10	1 YEAR
31	DAILY QUALITY CLEARANCE CERTIFICATE	QMQ-31	IBI\QA\R\QCC\31	IBI\QA\CL\FR-2\SL-11	1 YEAR
32	NON CONFORMANCE OF PRODUCTS	QMQ-32	IBI\QA\R\NCP\33	IBI\QA\ML\FR-3\SL-10	1 YEAR
33	BIN CARD	QMQ-33	IBI\QA\C\BC\33	IBI\QA\CL\TBL-01\D-02	---
34	PEST CONTROL	QMQ-34	IBI\QA\R\PC\34	IBI\QA\CL\FR-02\SL-12	---
35	PFA CASES	F-01	IBI\QA\F\PFA\01	IBI\QA\TO\ALM-01\SL-01	5 YEAR
36	EXPORT	F-02	IBI\QA\F\EXP\02	IBI\QA\TO\ALM-01\SL-01	2 YEARS
37	PRODUCTS COMPLAINT	F-03	IBI\QA\R\COMP\03	IBI\QA\TO\ALM-01\SL-01	2 YEARS
38	OFFICE CIRCULAR	F-04	IBI\QA\F\OC\04	IBI\QA\TO\ALM-01\SL-01	2 YEARS
39	TEST REPORTS/CERTIFICATES	F-05	IBI\QA\F\TR\05	IBI\QA\TO\ALM-01\SL-01	2 YEARS
40	ISI	F-06	IBI\QA\F\ISI\06	IBI\QA\TO\ALM-01\SL-01	1 YEAR
41	ISI BOOKLETS	F-07	IBI\QA\R\ICIB\07	IBI\QA\TO\ALM-01\SL-01	1 YEAR
42	SPECIFICATION OF RAW MILK	F-08	IBI\QA\R\SRM\08	IBI\QA\TO\ALM-01\SL-01	1 YEAR
43	R & D	F-09	IBI\QA\R\R&D\09	IBI\QA\TO\ALM-01\SL-01	5 YEARS
44	TECHNICAL LITRATURE	F-10	IBI\QA\R\TL\10	IBI\QA\TO\ALM-01\SL-01	1 YEAR

PL => PROCESS LAB
CL => CENTERAL LAB
ML => MICRO LAB

INNOVATIVE BUSINESSS IMPROVEMENTS PVT. LTD.

TEST FREQUENCY FOR PLANT STERILITY TEST

ANNEXURE - 'B'

SR NO	EQUIPMENT & LOCATION	FREQUENCY	Q.A. REGISTER
A.	RECEPTION SECTION		QMQ – 14
	1) Milk Can	Weekly	
	2) Tanker	- do - -	
	3) Raw Milk Pipe Line	- do - -	
	4) Raw Milk tank / silo	- - do - -	
B.	PROCESSING		QMQ – 14
	1) Pasteurized Milk Tank	Weekly	
	2) Pipe Line	Weekly	
	3) Cream Tank	Weekly	
	4) Pipe Line from cream tank to butter churn.	Weekly	
C.	POWDER MAKING SECTION		QMQ – 14
	1) Silo I to III	Weekly	
	2) Pipe line Silo to Evaporator	Fortnightly	
	3) Pipe line evaporator to con.vat	- do - -	
	4) --- do -- II	- do - -	
	5) Con. Vat - I & II	- do - -	
	6) Atomizer Line - I	- - do - -	
D.	LINE TEST FOR MILK PRODUCTS		QMQ – 14
	1) Liquid Milk	Weekly	
	2) SMP	- - do - -	
E.	AERIAL FLORA		QMQ – 14
	1) Sifter Room	Weekly	
	2) Sifter Gallery		
	3) Nitrogen Gas Packing Room		
	4) Near dehumidifier		
F.	YEAST AND MOULD COUNT (Aerial Flora)		QMQ – 14
	1) Butter Packing Room.	Weekly	
G.	Bacteriological testing of tao water	Weekly	

Prepared by **H O D**	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

INNOVATIVE BUSINESSS IMPROVEMENTS PVT. LTD.

TEST TO BE PERFORMED FOR PACKING MATERIAL

ANNEXURE - D

SR NO	TYPE OF SAMPLE	SAMPL-ING POINT	TESTS	FREQU ENCY	Q.A. REGISTER NO	OFFICER RESPONSIBLE
1.	Corrugated boxes	Vehicle	Size, No of plies, bursting strength, printing, & moisture %	Each consignment	QMQ – 10	Chemist / Exec (Micro)
2.	Polyfilm (Milk & Ghee)	Vehicle	Printing, Statutory Requirements, width, GSM, thickness, drop test, pin holes., Ink fastness, uniformity in thickness.	Each consignment	QMQ – 10	Chemist / Exec. (Micro)
3.	Aluminum foil	Store	Printing, diameter smell, weight, thickness	Every consignment	QMQ-10	Chemist / Exec.(Micro)
4.	Mono Cartons (Ghee, Malai-kulfi, Chocobar, Butter. Milk cake)	Store	Dimensions, weight, GSM & Printing	Every consignment	QMQ-10	Chemist / Exec.(Micro)
5.	Kraft Paper Bag	Store	Size, Printing, GSM weight & drop test	Every consignment	QMQ-10	Chemist / Exec.(Micro)
6.	Polythene liner (bags) 1kg / 25 kg	Vehicle	Size, Thickness, Printing, Weight, Drop test, pinholes,strength, seal,writingmatter .	Every consignment	QMQ-10	Chemist / Exec. (Micro)

ANNEXURE – D

SR NO	TYPE OF SAMPLE	SAMPL-ING POINT	TESTS	FREQU ENCY	Q.A. REGISTER NO	OFFICER RESPONSIBLE
7.	Ghee Tins (All Sizes)	Vehicle	Thickness, printing, lacquering & weight & sealing	Every consignment	QMQ-10	Chemist / Exec.(Micro)
8.	Glass wares	Store	Dimensions, capacity / calibration & standardization.	Every consignment	QMQ-10	Chemist / Exec.(Micro)
9.	Milk Can	Store	Volume, weight workmanship	Do	QMQ-10	Chemist / Exec.(Micro)
10.	Crown cork	Store	Printing matter, thickness, weight & height	Every consignment	QMQ-10	Chemist / Exec.(Micro)
11.	Plastic containers (All Types)	Store	Printing volume & weight	Every consignment	QMQ-10	Chemist / Exec.(Micro)
12.	Parchment Paper	Store	GSM, Size, Bursting Strength Grease test & Moisture %	Every consignment	QMQ-10	Chemist / Exec.(Micro)
13.	Milk Crates (Plastic)	Store	Size, Colour (Internal Dimensions), Weight & drop test.	Every consignment	QMQ-10	Chemist / Exec.(Micro)
14.	BOPP tape	Store	Size, stickiness, GSM of paper & Gum	Every consignment	QMQ-10	Chemist / Exec.(Micro)

INNOVATIVE BUSINESSS IMPROVEMENTS PVT. LTD.
TEST TO BE PERFORMED FOR
DETERGENT, DISINFECTANTS AND CHEMICALS

01 of 01

ANNEXURE - E

SR NO	TYPE OF SAMPLE	SAMPL-ING POINT	TESTS	FREQU ENCY	Q.A. REGISTER NO	OFFICER RESPONSIBLE
1.	Amyl alcohol	Barrel /Jerry Can	Colour, Blank test, fat camprison with standard alcohal (L.R. Grade)	Every consignment	QM-Q10	DM (QA) Chemist / Bact.
2.	Sulphuric Acid	Tanker	Specific gravity / strength, colour, Blank test, sediment	Every consignment	QM-Q10	DM (QA) Chemist / Bact.
3.	Caustic soda Flakes & Lye	Store	Colour, alkality (purity)	Every consignment	QM-Q10	DM (QA) Chemist
4.	Soda Ash	Store	Purity Sediment	Every consignment	QM-Q10	DM (QA) Chemist
5.	Trisodium Phosphate	Store	Purity sediment	Every consignment	QM-Q10	DM (QA) Chemist
6.	Bleaching Powder	Store	Colour, available cholrine	Every consignment	QM-Q10	DM (QA) Chemist
7.	Nitric Acid	Tanker/ Barrel	Colour, Purity % (Strength)	Every consignment	QM-Q10	DM (QA) Chemist
8.	Iodophore	Store cans	Colour, available Iodine percent	Every consignment	QM-Q10	DM (QA) Chemist

INNOVATIVE BUSINESSS IMPROVEMENTS PVT. LTD.
TESTS TO BE PERFORMED FOR
EDIBLE RAW MATERIALS

01 OF 01

ANNEXURE – F

SR NO	TYPE OF SAMPLE	SAMPL-ING POINT	TESTS	FREQU ENCY	Q.A. REGISTER NO	OFFICER RESPONSIBLE
1.	Common Salt	Store	Colour, foreign particles.	Every consignment	QM-Q10	DM (QA) Chemist / Bact.
2.	Sugar	Store	Colour, Foreign particles & Moisture.	Every consignment	QM-Q10	DM (QA) Chemist / Bact.
3.	Butter Colour	Store	Sediment	Every consignment	QM-Q10	DM (QA) Chemist / Bact.

SPECIFICATIONS FOR ETP'S WATER

01 of 01

ANNEXURE – I

SR. NO.	PARTICULARS	DESIRED NORMS
I	PH	7 – 9
II	Suspended solids (MAX)	100 PPM
III	COD (MAX)	250 PPM
IV	BOD (MAX)	30 PPM
V	Oil & Grease (MAX)	10 PPM

SPECIFICATIONS FOR PANEER

ANNEXURE - M

SR. NO	PARTICULARS	PFA	BIS	IBI (Small Packing)	B U L K P A C K I N G
I	PHYSICAL				
1.	Taste / Flavour	N.S	N.S	Good, pleasant & clean flavour	Good, pleasant & clean flavour
2.	Texture & Body	N.S	N.S	Compact, free from oozing moisture	Compact, free from oozing moisture
II	CHEMICAL				
1.	Moisture % (Max.)	70	60	55 – 62	55 – 62
2.	Fat % (on dry matter basis	50	50	22	20
3.	Acidity % (As lactic acid)	N.S	0.50	0.55	0.55
III	BACTERIOLOGICAL				
1.	SPC / gm. (MAX)	N.S	500000	5000	5000
2.	Y & M / gm.	N.S	250	50	50
3.	Coli / gm.	N.S	90	10	10

- **N.S. Not Specified**

ANNEXURE – N

SPECIFICATION FOR PINNI

SR NO.	PARTICULARS	IBI
I	PHYSICAL	
1.	Taste / Flavour	Pleasant sweet with cardmom flavour
2.	Testure & Body	Granular Compact, with additional dry fruits
3.	Colour	Light Brown
4.	Extraneous matter	Absent
II	CHEMICAL	
1.	Fat % (Min)	25.00
2.	SNF % (Min)	12
3.	Sugar % (Max.)	25
4.	Total milk solids	62
III	BACTERIOLOGICAL	
1.	SPC / gm.	5000
2.	Coli / gm.	Nil

ANNEXURE – N

SPECIFICATIONS FOR CURD

SR NO.	PARTICULARS	IBI
I	PHYSICAL	
1.	Taste / Flavour	Pleasant sweet, Diacetyl flavour
2.	Testure & Body	Smooth, free from whey
3.	Colour	Creamy White
4.	Extraneous matter	Absent
II	CHEMICAL	
1.	Fat % (Min)	2.0
2.	SNF % (Min)	9.50
3.	Total milk solids	11.5
III	BACTERIOLOGICAL	
1.	SPC / gm.	10
2.	Coli / gm.	

INNOVATIVE BUSINESSS IMPROVEMENTS PVT. LTD.

SPECIFICATIONS FOR YOGHURT, MILK CAKE & LASSI

ANNEXURE – N

SR NO.	PARTICULARS	MILK CAKE	LASSI
I	PHYSICAL		
1.	Taste / Flavour	Good, sweet crisp	Pleasant sweet, Diacetyl flavour
2.	Texture & Body	Compct granular	Smooth, free from whey
3.	Colour	Light brown to dark brow	Creamy White
4.	Extraneous matter	Absent	Absent
II	CHEMICAL		
1.	Fat % (Min)	20	3.5 – 3.6
2.	SNF % (Min)	40	7.4 – 7.8
3.	Sugar	30.0	9.8 - 10.0
4.	Total milk solids	85 %	20 - 20.7
III	BACTERIOLOGICAL		
1.	SPC / gm.	5000	_____
2.	Coli / gm.	Nil	10

INNOVATIVE BUSINESSS IMPROVEMENTS PVT. LTD.

SPECIFICATIONS FOR STERILIZED FLAVOURED MILK

ANNEXURE – O

S.NO	PARTICULARS	DOUBLE TONED MILK
	GENERAL : CARDAMOM FLAVOUR / COFFEE / STRAWBERY CHOCOLATE / BUTTER SCOTCH / ROSE	
I	PHYSICAL	
	1) Appearance / colour	Homogeneous, light caramalised colour
	2) Light caramalised colour / light	- VE
	3) Extraneous matter	Nil
	4) Fat Globules	No free fat globules, Homogenous.
	5) Loose Croking	No
	6) Flavour	Pleasant
II	CHEMICAL	
	a) Fat % (Min) b) SNF % c) Sugar % (All variety) d) Acidity % (Max) e) No curdling when in cubated at 37°C for 3 days	1.8 to 2.0 9.00 to 9.20 6.5 0.165 - VE
III	BACTERIOLOGICAL	
	1) Spore / ml. (Max) 2) SPC / ml. 3) Coliform count / ml.	5 Nil Nil

INNOVATIVE BUSINESS IMPROVEMENTS PVT. LTD.

PERSONNEL HYGIENE

ANNEXURE – 'P'

1. ALL STAFF MEMBERS MUST ENSURE PERSONAL CLEANLINESS
2. MUST WEAR CLEAN UNIFORMS IN WORK AREAS.
3. HANDS MUST BE WASHED AND SANITIZED AFTER GOING TO TOILET AND BEFORE ENTERING THE PLANT.
4. NO ONE SHOULD CARRY OR CONSUME EATABLES WITHIN THE FACTORY PERMISES.
5. SMOKING, SPITTING AND CHEWING TABACOO / ZARDA IS STRICTLY PROHIBITED.
6. TOUCHING THE PRODUCTS BEING MANUFACTURED / PACKED WITH BARE – HANDS IS PROHIBITED.
7. EVERY INDIVIDUAL MUST HAVE TRIMMED NAILS & COVER HIS HAIR WITH CAP / TURBAN.
8. USE OF HAND GLOVES, FACE MASKS AND CAPS IS ESSENTIAL WHEREVER SPECIFIED.
9. KEEPING ITEMS IN BREAST POCKETS, WEARING RINGS AND CHAINS IN WORKING AREAS IS NOT ALLOWED.
10. STAFF MEMBERS MUST INFORM THEIR OFFICER / INCHARGE IN CASE OF ANY CUTS, WOUNDS, SKIN INFECTIONS AND CONTAGIOUS DISEASES.

PROCEDURE FOR FUMIGATION

01 OF 02

ANNEXURE – Q

1. All the materials must be kept on pallets in stacks as follows:-

   I. SMP Stack of 4 pallets
   Bag height upto 12 (max.)

   This 4 pallets stack must have a clear space of 1 Ft. on all the 4 sides (i. E. to be 1 Ft. away from walls and 1 Ft. away from any other stock)

2. Before stacking, the floors and walls of the godown must be cleaned every time.

3. Celphos tablets (114 Nos for store approx. 780 M3) must be equally distributed on all the pallets. The celphos tablets must be kept on top of the stack and in the middle of the stack. No tablets must be kept on the pallets or the floor.

4. Immediately after placing the tablets, the main door must be closed and made air tight (the exhaust fan opening be made air tight before putting tablets) Paper be affixed on opening i.e. window, door & exhaust fan to make it air tight exit point to closed.

5. The store must be kept under fumigation for 5 days (Min. 120 hrs.)

6. After opening the store, the remaining ash of the tablets must be removed and burnt or buried away from the premises.

7. The bags must be thoroughly checked before transportation to the factory and even if a single live weevil found, the whole consignment must be again fumigated and stores to the intimated accordingly.

8. A fumigation chart is displayed on the door of every store indicating the date of fumigation, due date of opening, actual date of opening, material fumigated, nos. of bags (or quantity fumigated and quantity of fumigate used) These charts after removal must be kept in a file or atleast for one year.

9. The records must be available in the premises of the fumigation store all the time and made available to any authorised officer desirous of seeing them.

02 OF 02

ANNEXURE – Q

PRECAUTIONS

1. All electrical appliances (fans, lights and tubes) must be switched off before making the store air tight.

2. Upon opening the store gate (after fumigation), no one should enter the chamber or remain in the corridor at least for half an hour.

3. All the celphos tins, vials and as must be either be burnt of buried in the ground.

4. At the time of fumigation and opening the store there must be atleast two persons doing the job for safety reasons.

5. The persons handling the fumigation materials must be fully trained for the job.

6. General safety measures must be followed as usual.

Frequency - Once in a month (Min.)
- Once in a month (during Rainy season)

SPECIFICATIONS FOR ETP'S WATER

01 of 01

ANNEXURE – R

SR. NO.	PARTICULARS	DESIRED NORMS
I	PH	7 – 9
II	Suspended solid	Not more than 100 PPM
III	COD	Not More than 250 PPM
IV	BOD	Note More than 30 PPM
V	Oil & Grease	Not More than 10 PPM

SPECIFICATIONS FOR HUSK

ANNEXURE – T

SR. NO.	PARTICULARS	DESIRED NORMS (MUISTHRE %)	DUST %
I	FOR WINTER AND SUMMER	10.00 (MAX.)	4.00 (MAX.)
II	FOR RAINY SEASON	12.00 (MAX.)	4.00 (MAX.)

ANNEXURE – 'V'

PRODUCT :

NAME OF CUSTOMER :

ADDRESS :

PRODUCT STATUS REPORT

FLAVOUR OF PRODUCT	(EXCELLENT / GOOD / SATISFACTORY)
TASTE OF PRODUCT	(EXCELLENT / GOOD / SATISFACTORY)
COMPOSITION & CONTENTS	(MEETING SPECIFIED STANDARDS / NOT MEETING SPECIFIED STANDARDS)
BACTERIOLOGICAL QUALITY	(MEETING SPECIFIED STANDARDS / NOT MEETING SPECIFIED STANDARDS)

QUALITY STATUS COMPARISON WITH OTHER BRANDS

- Name of the Brands having better quality than MILK TIME & why ?

_____

_____

- Name of the Brands which are equivalent to MILK TIME products quality wise.

_____

_____

- Suggestions for further improvement in quality.

_____

_____

ANNEXURE – 'W'

SR. NO.	PARTICULAR LICENCE	DUE DATE RENEWAL	ACTION TO BE INITIATED	RESPONSIBILITY
1.	S.M.P	15 / 04	01 / 04	HOD
2.	W.M.P	01 / 09	15 / 08	HOD
3.	F.P.O	31 / 12	01 / 12	HOD
4.	EXPORT	06 / 11	06 / 09	HOD
5.	AGMARK	31 / 03 / 04	28 / 02	HOD

ANNEXURE 'X'

NORMS FOR PRIME PERFORMANCE PARAMETERS (QUALITY ASSURANCE)

SR. NO.	PARTICULAR	TARGET
1.	FAT / SNF recovery (Winter / Summer)	99.5 / 99.0
2.	Conformation of Products to IBI norms	100
3.	Monitoring of HACCP	100
4.	Consumables per kg of Milk (Winter / Summer) [paisa]	0.4 / 0.6
5.	Accuracy of milk testing	100
6.	Quality complaints	Zero
7.	Return / Rejected Products from Mkt.	Zero
8.	Statutory Compliances	100
9.	Renewal of Licences	On time
10.	ISO implementation	100
11.	Printing & Stationary (Rs.) [Monthly Expenses]	1000
12.	Liveries (Rs.)	500
13.	Travelling Allwance (Rs.)	1000

ANNEXURE – 'Y'

TRAINING PROGRAMME SECHDULE FOR Q.A. & PROCUREMENT DEPARTMENT

SR. NO.	EMPLOYEES	MONTHS FROM		TO
1.	Dairy Man / Testers	1st May	-	15th May
2.	Centre Incharge	16th May	-	30th May
3.	Zone Incharge	1st June	-	15th June
4.	Lab Attendant / Lab Assistant	16th June	-	31st June

INNOVATIVE BUSINESS IMPROVEMENTS PVT. LTD.

TEST FREQUENCY OF MILK PRODUCTS

ANNEXURE - A

S.NO.	PRODUCT	SAMPLING POINT	TESTS	FREQUENCY	Q.A. REGIS.	RESPONSIBILITY
1	RAW MILK	a) Milk Cans	Taste and Flavour (T/F),Temp.,Acidity%, COB, Alcohol test,RA Test, adultrants,preservatives, Fat,SNF & Methylene Blue Reduction Time (MBRT)	Composite sample	QMQ-01	Lab Asstt./Chemist
		b) MCC Milk	T/F, Temp., Alcohol test, Acidity%, COB, RA Test, adultrants, Preservatives, Fat, SNF & Sodium ions, MBRT,B.R. Test	Each Tanker	QMQ-01	Lab Asstt./Chemist
		c) Contractor's milk	T/F, Temp.,Acidity%, COB,Total Ash Adultrants, Preservatives, RA Test, B.R. Test, Sodium ions, FAT & SNF,Total Protein / Cascin Protein.	Each Tanker	QMQ-01	Lab Asstt./Chemist
2	RAW MILK	Storage Tanks	T/F, Temp., Acidity%, Alcohol Test,COB	Twice in a shift (Min.)	QMQ-02	Lab Asstt./Chemist
			Fat%,SNF%, RA Test, Sediment & MBRT	Once in a shift (Min.)		Lab Asstt./Chemist
3	BUTTER MILK	Butter Churn	Temp.,Acidity%, Fat% & Alcohol test	Each lot	QMQ-02	Lab Asstt./Chemist
4	PASTEURIZED MILK	All Storage Tanks	T/F, Acidity%, Alcohol Test, Fat%, SNF%, MBRT & Sediment.	Once in a Shift or as per need	QMQ-02	Lab Asstt./Chemist
5	PASTEURIZED MILK (CITY SUPPLY) SM, TM, DTM & SKIMMED MILK	ST1 & ST2	T/F, Temp.,Acidity%, Alcohol Test (60%) Sediment, MBRT, FAT%, SNF%,Sodium ion.	Each tank	QMQ-02	Lab Asstt./Chemist
6	CAUSTIC STRENGTH	CIP tank	% Alkalinity	Once in a shift(Min.)	QMQ-02	Lab.Asstt./Chemist
7	CHLORINE SOLUTION	CIP tank	Chlorine Strength in PPM	Once in a shift (Min.)	QMQ-02	Lab.Asstt./Chemist
8	RESIDUAL CHLORINE IN WATER	Tap Water	Residual chlorine in PPM	Once in a shift (Min.)	QMQ-02	Lab.Asstt./Chemist
9	SKIMMED MILK	Pasteurizer out let	Fat% & Sediments, Temp. of pasteurization	Every 10 mts.	QMQ-03	Lab Asstt./Chemist
10	CREAM	Cream balance tank	Fat%	Hourly basis	QMQ-03	Lab Asstt./Chemist
11	PASTEURIZED MILK (CITY SUPPLY) SM,DTM,TM , SKM & FCM.	Filling Point	T/F,Temp.,Acidity%,Fat% and SNF%	First Pouch of each Category Milk & after Every two Hours	QMQ-04	Lab Asstt./Chemist
		Filling Point	Drop Test	1 Hourly	QMQ-04	Lab Asstt./Chemist
		Milk pouch Samples at time of despatch	T/F, Temp., Acidity%, Shelf life	8.0 Morning 11 " 8 Eveinig 11 "	QMQ-04	Lab Asstt./Chemist

Prepared by **H O D** Signature_____Date 01.04.04	Approved by **CEO** Signature_____Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

INNOVATIVE BUSINESS IMPROVEMENTS PVT. LTD.

TEST FREQUENCY OF MILK PRODUCTS **ANNEXURE - A**

S.NO.	PRODUCT	SAMPLING POINT	TESTS	FREQUENCY	Q.A. REGIS.	RESPONSIBILITY
12	PASTEURIZED MILK (CITY SUPPLY)	Filling Point	MBRT (Alternate M/C)	2 Hourly	QMQ-28	Lab Asstt./Chemist
	SM,DTM,TM,FCM & SKM.	Cold Store	MBRT	At the time of despatch	QMQ-28	Lab Asstt./Chemist
13	POUCHED MILK (CITY SUPPLY) SM,DTM,TM & SKM	Filling Point & cold store	Weight of pouches	1 hour	QMQ-21	Lab Asstt./Chemist
14	WHITE BUTTER	Churn	T/F, Presence of free Moisture, Fat%, Curd%, Moisture%, &Acidity%	Every Lot	QMQ-08	Lab Asstt./Chemist
15	TABLE BUTTER	Churn	T/F, Colour, Texture & body ,Presence of free Moisture,Fat%, curd% , Moisture%, &Acidity%	Every Lot	QMQ-08	Lab Asstt./Chemist
16	GHEE	Filling Tank	T/F, Colour, Moisture%,Temp.,FFA%, RM,PV,BR & Sediment	Every filling Tank	QMQ-07	Agmark Chemist
17	SKIMMED MILK POWDER	Sifter Room	Gravimetric Moisture Ash Content	Two hourly Each Silo	QMQ-09	Lab.Asstt./Chemist
	WHOLE MILK POWDER	Sifter Room	Gravimetric Moisture Ash Content	Two hourly Each Silo	QMQ-09	Lab.Asstt./Chemist
	DAIRY WHITENER	Sifter Room	Gravimetric Moisture Ash Content	Two hourly Each Silo	QMQ-09	Lab.Asstt./Chemist
18	PASTEURIZED MILK (CITY SUPPLY)	Filling Point	Total solid of liquid milk by gravimetric method	Once a week	QMQ-09	Exec.(QA),Chemist
19	SKIMMED MILK POWDER	Sifter Room	T/F,Colour,Moisture%(IR),Scorched particles, BD,Temp. of Powder, NTP Temp..DSI Temp.	Half Hourly	QMQ-06A	Lab.Asstt./Chemist
			Insol.Index,Acidity% ,Fat%, Ash%, RA test. (For Export Grade)	Each Silo	QMQ-06A	Lab.Asstt./Chemist
20	DAIRY WHITENER	Sifter Room	T/F,Colour, Moisture%,Scorched -particles,BD, Temp.of Powder,NTP Temp.	Half Hourly	QMQ-06B	Lab.Asstt./Chemist
			Insol.Index,Fat%, Acidity%, ASH%, RA Test	Each Silo	QMQ-06B	Lab.Asstt./Chemist
21	MILK POWDER	Sifter Room (Filling Point)	T/F,Colour,Moisture%(IR),Scorched particles, BD,Temp. of Powder, NTP Temp.,DSI Temp.	Half Hourly	QMQ-06C	Lab.Asstt./Chemist
			Insol.Index,Acidity% ,Fat%, Ash%, RA Test	Each Silo	QMQ-06C	Lab.Asstt./Chemist
22	SMP (Consumer Pack)	Packing Room	T/F, Moisture%, Bulk Density,scroched particles	1 Hourly	QMQ-24	Lab.Asstt./Chemist
23	DAHI	Packing Room (Cup)	T/F, Acidity %,Fat%, Total Solids ,Texture & body	Every Lot	QMQ-05	Lab.Asstt./Chemist

Prepared by **H O D** Signature_____Date 01.04.04	Approved byCEO Signature_____Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMMRP-02]

INNOVATIVE BUSINESS IMPROVEMENTS PVT. LTD. Page 03 of 03

TEST FREQUENCY OF MILK PRODUCTS **ANNEXURE - A**

S.NO.	PRODUCT	SAMPLING POINT	TESTS	FREQUENCY	Q.A. REGIS.	RESPONSIBILITY
24	PANEER	Packing Room	T/F, Fat%, Moisture%, Texture & body Total Solids%.	Every Lot	QMQ-05	Lab.Asstt./Chemist
25	MILK CAKE	Packet	T/F, Colour, Fat%, TS %, Texture & body	Every Lot	QMQ-05	Lab.Asstt./Chemist
26	LASSI	Pouch	T/F,Acidity%,Fat%,Total Solids%	Every Lot	QMQ-05	Lab Asstt./Chemist
27	SFM	Milk from ST3 Tank Bottles	T/F, Acidity, FAT %, SNF %,Alcohol test (70%) ,Sediments & creaming index T/F, FAT %, T.S %	Each lot Each variety	QMQ-05 QMQ-05	Lab Asstt./Chemist Lab Asstt./Chemist
28	ICE-CREAM	Ice-Cream mix Ice-Cream Cup	T/F, Fat%, T.S. %, Protein %. T/F, Colour,Fat%, T.S. %, Protein %.	Each lot Each variety	QMQ-25	Lab Asstt./Chemist Lab Asstt./Chemist
29	EFFLUENT WATER	Out let of ETP	Colour,pH,TS, TDS, TSS. Oil & grease. COD & BOD.	Once in a week (Min.)	QMQ-15	Chemist/Bact./ Ex (QA)
30	POUCHED MILK (CITY SUPPLY) SM,DTM,TM & SKM	Pouch	SPC, Coliform	Alternate day	QMQ-12	Ex.(Micro)
31	WHITE BUTTER	Butter Packed	Coliform, Y & M count	Every Lot	QMQ-12	Ex.(Micro)
32	TABLE BUTTER	Butter Packed	Coliform, Y & M count	Every Lot	QMQ-12	Ex.(Micro)
33	PANEER	Packing room	SPC,Coliform, Y & M count	Every Lot	QMQ-12	Ex.(Micro)
34	DAHI	Cup	Coliform	Every Lot	QMQ-12	Ex.(Micro)
35	MILK CAKE	Packet	Coliform	Every Lot	QMQ-12	Ex.(Micro)
36	ICE-CREAM	Cup	Coliform	Each Variety	QMQ-12	Ex.(Micro)
37	SKIMMED MILK POWDER EXPORT GRADE	Sifter room	SPC, Thermophiles & Coliform S.Aurees,Salmonella & Shigella	After every 50 Bags Monthly	QMQ-11	Ex.(Micro)
38	SKIMMED MILK POWDER , DAIRY WHITENER MILK POWDER &	Sifter room	SPC, Coliform S.Aurees,Salmonella & Shigella	After Every 100 bags Monthly	QMQ-11	Ex.(Micro)
39	SMP (Consumer Pack)	Packing Room	SPC,Coliform	Composit	QMQ-11	Ex.(Micro)

Prepared by **H O D** Approved by **CEO**

Signature_____Date 01.04.04 Signature_____Date 01.04.04

Issue No. 01 Date 01.04.04 Revision No. 0 Date 01.04.04

[QMMRP-02]

INNOVATIVE BUSINESS IMPROVEMENTS PVT.LTD.

TEST FREQUENCY FOR PLANT STERILITY TEST

ANNEXTURE -B

S.NO.	EQUIPMENT & LOCATION	FREQUENCY	Q.A. REGISTER	RESPONSIBILITY
A.	**RECEPTION SECTION**			
	1) Milk Cans	Weekly	QMQ-14	Exec.(Micro)
	2) Tanker	Weekly		
	3) Raw Milk Pine Line	Weekly		
	4) Raw Milk Tank/Silo	Weekly		
B.	**PROCESING**			
	1) Pasteurised Milk Tank	Weekly	QMQ-14	Exec.(Micro)
	2) Pipe Line	Weekly		
	3) Cream Tank	Weekly		
	4) Pipe Line From Cream Tank to Butter Churn	Weekly		
C.	**POWDER SECTION**			
	1) Silo 1 to Silo 3	Weekly	QMQ-14	Exec.(Micro)
	2)Pipe Line Silo to Evaporator	Fortnightly		
	3)Pipe Line Evaporator to Conc.Vat-I	Fortnightly		
	4)Pipe Line Evaporator to Conc.Vat-II	Fortnightly		
	5) Conc. Vat I & II	Fortnightly		
	6) Automizer Line	Fortnightly		
D.	**LINE TESTING FOR MILK PRODUCTS**			
	1) Liquid Milk	Weekly	QMQ-19	Exec.(Micro)
	2) Skimmed Milk Powder	Weekly		
E.	**AERIAL FLORA**			
	1) Sifter Room	Weekly	QMQ-13	Exec.(Micro)
	2) Sifter Gallery	Weekly		
	3) Nitrogen Gas Packing Room	Weekly		
	4) Near Dehumidifier	Weekly		
	5) 1 Kg Packing Room	Weekly		
F.	**YEAST & MOULD COUNT (Areal Flora)**			
	1) Butter Making Room	Weekly	QMQ-13	Exec.(Micro)
	2) Butter Packing Room	Weekly		
G.				
	Swab of workers	Weekly	QMQ-13	Exec.(Micro)
	Tap water Bacteriology	Weekly		

Prepared by **H O D**	Approved by CEO
Signature_____Date 01.04.04	Signature_____Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMMRP-02]

INNOVATIVE BUSINESS IMPROVEMENTS PVT. LTD.

GUIDELINES FOR MIXING INGREDIENTS FOR MAKING INDIGENIOUS MILK PRODUCTS

ANNEXURE - C

S.NO.	MILK LOT KG	TOTAL LOT QTY. (KG)	PRODUCT SFM	FAT%		SNF%		SUGAR (KG)	SUGAR(%) IN FINISHED PRODUCT	TOTAL SOLIDS (%)	TYPE OF FLAVOUR USED	FLAVOUR %	COLOUR
				MILK TO BE USED	FINISHED PRODUCT	MILK TO BE USED	FINISHED PRODUCT						
1													
	600.00	642.00	Cardamom	2.00	1.90	9.80	9.20	41.70	6.50	17.60	Cardamom	0.05 %	------
	600.00	642.00	Strawberry	2.00	1.90	9.80	9.20	41.70	6.50	17.60	Strawberry	0.05 %	0.00 (Erthrocin)
	600.00	648.00	Coffee	2.00	1.90	9.80	9.20	41.70	6.50	17.90	0.3% coffee	------	------
	600.00	655.00	Chocalate	2.00	1.90	9.80	9.20	41.70	6.50	18.30	(3.0% Chocolate Slab)	0.03 %	0.04 (Caramel)
	600.00	642.00	Butter Scotch	2.00	1.90	9.80	9.20	41.70	6.50	17.60	*	0.05 %	0.016 Lemon Yellow
	600.00	642.00	Rose	2.00	1.90	9.80	9.20	41.70	6.50	17.60	ROSE	0.05 %	0.004 (Erthrocin)
2	40.00	55.50 (Add 10 kg water for 40kg curd)	Lassi	5.00	3.60	10.50	7.56	5.50	10.00	21.16	Kewra	0.01 %	------
3	250.00	--	Paneer	4.60	Min. 50% of T.S.	8.70	-----	-----	-----	-----	(Fat/SNF = 1.85 - 1.90)		
4	20.00	--	Milk Cake	4.60	20.00	8.60	40.00	Dry Sugar	25% of khoa Qty.			0.2 % (Card)	----

* M.B :- Mix Fruit Flavour is used in butter scotch flavour.
(Mix Fruit 40 % & Butter Scotch 60 %)

MGR (P) **G.M (T-2)** **G.M (T-1)**

237

Prepared by H O D

Signature_____Date_01.04.04

Approved byCEO

Signature_____Date_01,04.04

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD. **ANNEXURE - G**

SPECIFICATIONS FOR RAW MILK W.E.F. 11.08.2003

S.NO	PARTICULAR	V1	V2	V3	U
1	TASTE / FLAVOUR	V.GOOD	V.GOOD	V.GOOD	UNSATISFACTION
2	ACIDITY % a) at 9.0 % SNF b) C.O.B.	0.126 TO 0.135 - VE	0.126 TO 0.135 - VE	0.126 TO 0.135 - VE	More than 0.135
3	A) ROSOLIC ACID TEST	- VE	- VE	- VE	+VE
	B) ALCHOL TEST (60 %)	- VE	- VE	- VE	+ VE
4	SODIUM IONS (PPM) (AT 10% SNF)	476 TO 524	425 TO 475	Up to 424	More than 525
5	MBR TIME (MTS.) WINTER	20	30	40	10
6	MBR TIME (MTS.) SUMMER	10	15	20	5
7	ADULTRANTS & PRESERVTIVES	NIL	NIL	NIL	-VE
8	B.R. (AT 40 DEGREE C)	40-42.0	40-42.0	40-42.0	40-42.0
9	SNF % (MIN.)	8.30	8.50	8.80	8.3
10	TOTAL SOLIDS % (MIN.)	14.7	14.9	15.2	14.5

Winter - Oct. to March
Summer - April to Sept

HOD (QA) **MGR (PROC)** **GM (WORKS)** **CEO**

Prepared by **HOD**	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMMRP - 02]

INNOVATIVE BUSINESS IMPROVEMENTS PVT. LTD.

SPECIFICATIONS FOR LIQUID MILK

ANNEXURE -H

S.NO.	PARTICULARS	SKIMMED MILK	DTM	T.M.	S.M.
1	Taste	Pure Wholesome	Pure Wholesome	Pure Wholesome	Pure Wholesome
2	Extraneous Matter	Nil	Nil	Nil	Nil
3	Preservatives / Adultrats	- VE	- VE	- VE	- VE
4	FAT %	0.10 (Max)	1,55 to 1,6	3,05 - 3,10	4,55 - 4,60
5	SNF %	8,8 to 8,90	9,1 - 9,20	8,65 - 8,70	8,70 - 8,80
6	Acidity %	0,126 to 0,144	0,126 to 0,144	0,126 to 0,144	0,126 to 0,144
7	SPC / ML. (max.)	2,000	2,000	2,000	2,000
8	Coli / 1 ml. (max.)	10	10	10	10
9	ALCOHAL TEST (60%)	- VE	- VE	- VE	- VE
10	Desired MBRT (min) Hrs . Summe Winter	6,0 7,0	6,0 7,0	6,0 7,0	6,0 7,0

Prepared by **H O D**	Approved by **CEO**
Signature_____Date 01.04.04	Signature_____Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMMRP-02]

ANNEXURE 'I'

INNOVATIVE BUSINESS IMPROVEMENTS (PVT. LTD.
SPECIFICATIONS FOR PASTEURIZED TABLE BUTTER

SR. NO.	PARTICULARS	PFA	B I S	AGMARK	IBI
A	**PHYSICAL**				
1	Flavour & Aroma	N.S	N.S	Clean, pleasant characterstic flavour and free from objectionable taint or rancid flavour, Uniform, distribution of salt,	Clean, pleasant characterstic flavour and free from objectionable taint or rancid flavour, Uniform, distribution of salt,
2	Body & Texture	N.S	N.S	Homogeneous, no stickness, Body should be compact, uniform surface on breaking. Free moisture absent,	Homogeneous, no stickness, Body should be compact, uniform surface on breaking. Free moisture absent,
3	Extraneous matter	N.S	N.S	Absent	Absent
4	Colour	N.S	N.S	Shall be slight yellow and uniform, shall not show any streakiness, mottling stain	Shall be slight yellow and uniform, shall not show any streakiness, mottling stain
B	**CHEMICAL**				
1	FAT % (Min,)	80	80	80	80,5 TO 81,0
2	Curd % (Max,)	1,50	1,50	1,0	0,80
3	Salt % (Max,)	3,0	3,0	3,0	2,5 TO 2,6
4	Moisture % (Max.)	N.S.	N.S.	16,0	15,8 TO 16,0
5	Diacetyl (Max.) PPM	N.S.	4	4	Nil
6	Acidity % (Max.)	0,15	N.S.	N.S.	0.02
C	**BACTERIOLOGICAL**				
1	Y & M / gm. (Max.)	N.S.	50	N.S.	25
2	Coli / gm. (Max.)	N.S.	10	N.S.	10

* **N.S. - Not Specified**

Prepared by **H O D**	Approved by **CEO**
Signature Date 01.04.04	Signature Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMMRP-02]

ANNEXURE 'J'

INNOVATIVE BUSINESS IMPROVEMENTS PVT. LTD.

SPECIFICATIONS FOR GHEE

SR. NO.	PARTICULARS	PFA	AGMARK	IBI
	PHYSICAL			
1	Texture	N.S	The solid phase shall be of well defined granular structure	The solid phase shall be of well defined granular structure
2	Colour	N.S	White with or without yellowish or greenish tinge, shall be uniform throughout	White with or without yellowish or greenish tinge, shall be uniform throughout
3	Flavour & Aroma	N.S	Sweet, pleasant odour, free from Rancid flavour or objectionable flavour	Sweet, pleasant odour, free from Rancid flavour or objectionable flavour
4	Addition of colouring materials or preservatives	Nil	Nil	Nil
	CHEMICAL			
1	FFA % (as oleic Acid) [Max.]	3,0	a) Special grade - 1.4 % (Red) b) General - 2,5 % (Green) c) Standard Grade - 3,0 % (chocolate)	0,50
2	B.R. at 40 x C	40 - 43 (Punjab)	40 - 43	40 - 43
3	R.M. Valve (min)	28,0	28.0	29,0 (Min)
4	Moisture %	0,50	0.30	0.25 (Max)
5	Residue	N.S.	N.S.	Nil

* **N.S. - Not Specified**

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD. **ANNEXURE 'K'**

SPECIFICATIONS FOR SKIMMED MILK POWDER

SR. NO.	PARTICULARS	PFA	B I S	BIS	EXPORT - GRADE	G - GRADE	PREMIUM GRADE
A	**PHYSICAL**	N.S	STANDARD GRADE:- white or with greenesh tinge, light cream in colour, free from lump exept	EXTRA GRADE:- white or with greenesh tinge, light cream in colour, free from lump exept	Light cream in colour, free from lumps exept	Light cream in colour, free from lumps exept	Light cream in colour, free from lumps exept
1	Description	N.S	those that breakup readly under slight pressure	those that breakup readly under slight pressure	breakable	breakable	breakable
2	Taste / Flavour	N.S	Pleasins and clean, free from off flavour	Pleasins and clean, free from off flavour	Good pleasant free from off flavour	Good pleasant free from off flavour	Good pleasant free from off flavour
3	Bulk Density	N.S.	--	--	0.55 - 0.62	0.45 - 0.50	0.45 - 0.50
B	**CHEMICAL**						
1	Moisture % by mass (max.)	5.0	4.0	3.5	3.20 to 3.60	3.40 to 3.90	3.40 to 3.90
2	Fat % (max.) by mass (max.)	1.5	1.50	1.50	0.33 to 0.66	0.33 to 0.66	0.33 to 0.66
3	Total Soilds by mass (max.)	N.S.	96.00	96.00	96.6 to 96.4	96.6 to 96.4	96.6 to 96.4
4	Insolubility Index ml. (max.)	N.S.	1.5	1.5	0.50	0.50	0.50
5	Total Ash % (D.B.) Max.	8.20	8.20	8.20	8.20	8.30	8.20
6	Titrable Acidity % (max.)	1.5	1.5	1.5	1.1 - 1.35	1.1 - 1.35	1.1 - 1.35
7	Scorched Particles	N.S.	Resonably free from Scorched Particles	Resonably free from Scorched Particles	A' DISH	B' DISH	B' DISH
8	RA test	-VE	-VE	-VE	-VE	-VE	S1-VE
C	**BACTERIOLOGICAL**						
1	Standard Plate count / gm. (max.)	50000	50000	40000	10000	10000	50000
2	Thermophiles count / gm (max.)	N.S.	N.S.	N.S.	1000	-----	-----
3	B. Cerus / gm. (max.)	N.S.	N.S.	N.S.	300	-----	-----
4	Coliform / 0.1 gm	Absent	Absent	Absent	Absent	Absent	Absent
5	S. aureus / 0.1 gm	N.S.	N.S.	N.S.	Absent	-----	-----
6	Salmonella / 25 gm.	N.S.	N.S.	N.S.	Absent	-----	-----
7	Shigella 25 / gm.	N.S.	N.S.	N.S.	Absent	-----	-----
8	Preservatives / Adultrants	Nil	Nil	Nil	Nil	Nil	Nil
9	Sodium Level PPM (max.)	N.S.	N.S.	N.S.	575	650	650
10	Protein % (min.) (Dry matter basis	N.S.	N.S.	N.S.	35.0	36.0	38.0
			N.S.	N.S.	N.S.		

DB : Dry Basis

*** N.S. - Not Specified**

Prepared by **H O D**

Signature_____Date 01.04.04

Issue No. 01 Date 01.04.04

Approved by **CEO**

Signature_____Date 01.04.04

Revision No. 0 Date 01.04.04

INNOVATIVE BUSINESS IMPROVEMENTS PVT. LTD. **ANNEXURE - L**

SPECIFICATIONS FOR MILK POWDER

	TYPE OF POWER	MILK POWDER		
S.NO	PARTICULAR	PFA	B I S	IBI
1	PHYSICAL			
i	Taste / Flavour	N.S.	Good, pure pleasant, free from off flavour	Good, pure pleasant, free from off flavour
2	CHEMICAL			
i	Moisture % by mass (max.)	5,0	4.0	2.8 to 3.0
ii	Fat % (max)	26,0	26.0	26.0 to 27.0
iii	Total Soilds by Mass (Max.)	N.S.	N.S.	97.0 to 97.2
iv	Insolubility Index ml. (Max.)	N.S.	1.2	0.50
v	Total Ash % (DB) Max.	N.S.	7.30	6.0
vi	Titrable Acidity % (Max.)	1.2	1.20	1.0 to 1.10
vii	Scorched Particles	N.S.	N.S.	A disc
viii	RA test	N.S.	-VE	S1 + VE
3	BACTERIOLOGICAL			
i	Standard Plate count gm. (Max)	50000	40000	10000
ii	Coliform / 0,1 gm	Absent	Absent	Absent
iii	S. aureus / 0,1 gm	N.S.	Absent	Absent
iv	Salmonella / 25 gm.	N.S.	Absent	Absent
v	Shigella / 25 gm.	N.S.	Absent	Absent
vi	Preservaties / Adultrants	Nil	Nil	Nil
vii	Sodium Level PPM (Max)	N.S.	N.S.	600

DB :- Dry Basis

* N.S. Not Specified

HOD (QA) **MGR (PROC)** **GM (WORKS)** **CEO**

Prepared by **HOD**	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMMRP - 02]

ANNEXURE 'S'

PEST CONTROL

SR. NO.	TYPE OF CHEMICAL	% AGE OF PURITY	DILUTION TO BE USED
1	D.D.V.P.	76% EC	50 TIMES DILUTION
2	DELTA MALATHIN	2.8% EC	50 TIMES DILUTION
3	CYBER MATHRIN	10% EC	50 TIMES DILUTION
4	MALATHION	50% EC	50 TIMES DILUTION

Prepared by **H O D**	Approved by **CEO**
Signature_____Date 01.04.04	Signature_____Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMMRP-02]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.											PAGE NO. 1
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE											DATE : 0104.04
SHIFT :_____				INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.							Sr.No. _____
				RAW MILK ANALYSIS REPORT							DATE :_____
SR NO.	SR.NO. OF TANKERS -> PARTICULARS										
1	SUPPLIER'S NAME										
	TANKER NUMBER										
3	TIME (HRS)										
4	TEMP. DEG. C.										
5	TASTE/FLAVOUR(AT 45 ° C)										
6	ACIDITY %LA(AT 9.0 % SNF)										
7	ALCOHOL TEST(55% /60%)										
8	C O B										
9	ADULTRANTS -Sugar,Starch,M.D.,										
	Salt,Urea,Glucose,MgSo4 & Glycerol										
10	PRESERVATIVES -Formalin,Borax & H2o2										
11	B.R. (AT 40 DEG.C.)										
12	MBR TEST										
13	ROSOLIC ACID TEST										
14	CASEIN %/T.P.%(DB) FOR CONTRACTOR'S MILK										
15	SODIUM IONS ppm (AT 10% SNF)										
16	FAT (%)										
17	CLR										
18	SNF(%)										
19	GRADE										
20	FAT IN WORDS										
21	SNF IN WORDS										
22	RE-TEST (IF REQUIRED)										
23	Signature										

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-01]

245

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.	PAGE NO. 2
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE	DATE : 01.04.04

TANK POSITION REPORT

Sr.No. _____

SHIFT : _____ DATE _____

TIME	SOURCE	TYPE OF MILK	TEMP (°C.)	TASTE & FLAVOUR	ALCOHOL TEST (60%)	COB	ACIDITY (%LA) (AT 9%SNF)	FAT (%)	CLR	SNF (%)	SEDI-MENT	SODIUM PPM (AT 10% SNF)	SIGNATURE OF P.O

BUTTER MILK ANALYSIS			GHEE RESIDUE		ALKALINITY OF CIP SOLUTION				CHLORINE (PPM)		REMARKS
TIME(Hrs.)			Time	Fat%	TIME(Hrs.)				TIME(Hrs.)		
SOURCE					CIP TANK				TAP WATER		
ALC. (60%)					BOTTLE WASHER				CIP TANK		
ACIDITY(%LA)											
FAT (%)											

NAME OF LAB.ASSTT./SHIFT CHEMIST _____

SIGNATURE : ----------

P.O: Production Officer

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-02]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.	PAGE NO. 3
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE	DATE : 01.04.04

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

MILK SEPARATION REPORT

SR.NO._____

SHIFT_____ DATE _____

TIME (Hrs.)	SEP. NO.	PAST. NO.	FAT %	RMT NO	P/S TANK	CHILLING TEMP ° C	FAT % OF CREAM	SEDIMENT	TEMP. OF PAST.		REMARKS
									MILK	CREAM	

NAME OF LAB.ASSISTANT/SHIFT CHEMIST

NAME _____

SIGNATURE : _____

SEP = SEPARATOR

PAST.=PASTEURIZER

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-03]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

LIQUID MILK ANALYSIS REPORT

SHIFT : _____ Sr.No. _____

TIME	TYPE OF MILK	BATCH NO.	FILLING TEMP.	T/F	ALC TEST (60%)	ACI--DITY (%LA)	FAT (%)	CLR	SNF (%)	MILK POUCH CHECKING				SHELF LIFE STUDY							
										MACHINE NO.1		MACHINE NO.2		TYPE OF MILK	DT.OF PROD.	CODE	DATE	TIME	TEMP.	T/F	ACIDITY % LA
										HEAD-A	HEAD-B	HEAD-A	HEAD-B								
										DROP TEST	DROP TEST	DROP TEST	DROP TEST								

NAME OF SHIFT CHEMIST/LAB. ASSTT. DT. = DROP TEST ST

SIGNATURE _____

shelf life test frequency

Morning 8 AM 11 AM

Evening 8PM 11PM

TEMP. AT THE TIME OF DESPATCH		
TYPE	TEMP.	REMARKS
1		
2		

T/F = Taste/Flavor

ALC = Alcohol Test.

Prepared By H O D	Approved By CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

(QMQ-4)

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.								PAGE NO 5
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE								DATE : 01.04.04
INDIGENOUS PRODUCTS ANALYSIS REPORT								SR.NO._____
SHIFT_____								DATE_____
	PRODUCTS - >	PANEER	LASSI	DAHI	SFM	PINNI	MILK CAKE	REMARKS
A	INITIAL MILK ANALYSIS				1 | 2 | 3 | 4			
	PARAMETERS				| | |			
	TIME (Hrs.)				| | |			
	TASTE/FLAVOUR				| | |			
	ALCOHOL TEST (65 %)				| | |			
	ACIDITY (%LA)				| | |			
	FAT(%)				| | |			
	CLR				| | |			
	SNF(%)				| | |			
	TOTAL SOLIDS (%)				| | |			
B	ANALYSIS AFTER SUGAR ADDITION				| | |			
	TIME (Hrs.)				| | |			
	ALCOHOL TEST (70%)				| | |			
	FAT(%)				| | |			
	SNF(%)				| | |			
	TOTAL SOLIDS(%)				| | |			
C	ANALYSIS OF FINISHED PRODUCTS				| | |			
	TIME (Hrs.)				| | |			
	BATCH NO.				| | |			
	Taste/Flavour				| | |			
	ACIDITY (%LA)				| | |			
	FAT(%)				| | |			
	MOISTURE %				| | |			
	a) WT. OF DISH				| | |			
	b) WT. OF DISH+SAMPLE				| | |			
	c) WT.OF DISH AFTER EVAPORATION				| | |			
	d) MOISTURE%				| | |			
	TOTAL SOLIDS				| | |			
NAME OF LAB. ASSISTANT/ SHIFT CHEMIST _____								
SIGNATURE _____								
Prepared By H O D					Approved by CEO			
Signature _____ Date 01.04.04					Signature _____ Date 01.04.04			
Issue No. 01 Date 01.04.04					Revision No. 0 Date 01.04.04			

[QMQ-05]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.	PAGE NO. 6
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE	DATE : 01.04.04

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

SR.NO._____

SHIFT : _____

MILK POWDER ANALYSIS REPORT

DATE_____

TYPE OF POWDER _____

TIME (Hrs.)	BAG NO.	COL-OUR	T/F	MOISTURE %		SCORCH PARTICLES	B D gm/ml	I.I (ml)	R.A TEST	FAT (%)	ACIDI-TY (%LA)	PROT-EIN (% DB)	ASH (% DB)	SOD-IUM (PPM)	PROCESS PARAMETERS °C				SILO NO	CONC. VAT	REMARKS IF ANY
				IR	GR										EVAPORATOR		DRIER				
															NTP	DSI	OUT LET	POW-DER			

NAME _____

SIGNATURE _____

Shift Chemist/LAB. ASSTT.

IR=Infra Red-Reading

GR=Gravimatric Reading

II=Insolubility Index

POWDER SEGREGATION

BATCH NO.	BAG NO.	REASON

SILO	TIME	T/F	Sediment	Sodium PPM (10% SNF)
S1				
S2				
S3				

Prepared By H O D

Signature _____ Date 01.04.04

Issue No. 01 Date 01.04.04

Approved by CEO

Signature _____ Date 01.04.04

Revision No. 0 Date 01.04.04

[QMQ-06]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.						PAGE NO. 7
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE						DATE : 01.04.04
		GHEE ANALYSIS REPORT				SR.NO._____
SHIFT_____						DATE_____
Sr.No	PARAMETERS	SPECIFICATION	FT 1	FT 2	FT 3	REMARKS
1	TIME (HRS)					
2	TEMP. (C.)	40 ° C. (max.)				
3	TASTE/FLAVOUR	Pleasing				
4	COLOUR	Whitish				
5	MOISTURE (%)	0.20 to 0.25				
6	FFA (%OA)	0.30 (max.)				
7	B R (AT 40 ° C)	40 - 42.5				
8	R M VALUE	30 (Min.)				
9	P. VALUE	1.0 to 2.0				
10	SEDIMENT	Nil				
11	GRANULATION	GOOD				
12	MELT NO.					
13	PACK SIZE					
		GRAVIMETRIC RESULTS (MOISTURE %)				
Sr.No.	PARTICULARS		FT 1	FT 2	FT 3	REMARKS
1	TIME (Hrs.)					
2	WEIGHT OF DISH (A) gms.					
3	WEIGHT OF DISH + SAMPLE (B) gms.					
4	WEIGHT OF SAMPLE (C) gms.					
5	WEIGHT AFTER DRYING (D) gms					
6	MOISTURE (%) (B-D /C x 100)					
7	REMARKS					
NAME OF SHIFT CHEMIST / AGMARK CHEMIST SIGNATURE _____						
Prepared By H O D Signature _____ Date 01.04.04			Approved by CEO Signature _____ Date 01.04.04			
Issue No. 01 Date 01.04.04			Revision No. 0 Date 01.04.04			

[QMQ-07]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

BUTTER ANALYSIS REPORT

GRAVIMETRIC ANALYSIS

SR.NO._____

SHIFT_____ DATE_____

Sr.No.	TIME (Hrs.)	SOURCE	WT.OF DISH	WT.OF DISH + SAMPLE(gms)	WT.OF SAMPLE	WT.AFTER DRYING	MOISTURE (%)

FINISHED PRODUCT

Sr.No	PARAMETERS	BATCH NO.	BATCH NO.	BATCH NO.	BATCH NO.	BATCH NO.
1	TIME (Hrs.)					
2	FREE MOISTURE					
3	COLOUR					
4	TASTE & FLAVOUR					
5	CURD (%)					
6	SALT (%)					
7	FAT (%)					
8	B.R. READING					
9	MOISTURE %					
10	ACIDITY %					
11	STATUS					

NAME OF LAB ASSTT./SHIFT CHEMIST _____

SIGNATURE _____

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-8]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.	PAGE NO. 9
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE	DATE : 01.04.04

GRAVIMETRIC ANALYSIS REPORT

Sr.No._____

SHIFT_____ A) MOISTURE ANALYSIS OF POWDER Date _____

Sr. NO.	BATCH/ BAG NO.	TIME (Hrs.)	WT.OF DISH (gms)	WT.OF DISH +SAMPLE (gms)	WT.OF SAMPLE	WT.AFTER DRYING	MOISTURE (%)	
							IR	GR
1								
2								
3								
4								

B) ASH CONTENT OF POWDER

Sr. NO.	BATCH/ BAG NO.	TIME (Hrs.)	INITIAL WT. WT(gms)	SAMPLE WT. (gms.)	FINAL WT(gms)	ASH %	ASH% (D.B)	REMARKS
1								
2								
3								
4								

C) TOTAL SOLIDS OF MILK

Sr. NO.	SOURCE	TIME (Hrs.) FROM -TO	INITIAL WT. WT. (gms.)	SAMPLE WT. (gms.)	FINAL WT. (gms)	GRV. T.S.(%)	VOL. TS.(%)	VARIATION
1								
2								
3								
4								

NAME OF LAB. ASSTT/SHIFT CHEMIST

IR - INFRA RED

SIGNATURE : _____

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-09]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

CHEMICALS/ PACKING MATERIAL ANALYSIS REPORT

PRODUCT :_____ MRN NO.: _____

SUPPLIER'S NAME : _____ QUANTITY: _____

PACK SIZE : _____ DATE : _____

SAMPLES DRAWN (NOS): _____ DATE OF SAMPLING : _____

PARTICULARS ->						
SPECIFICATIONS ->						
SAMPLE NO.						
AVERAGE						

DEVIATION (%) REMARKS (ACCEPTED / REJECTED) NAME OF BACTERIOLOGIST SIGNATURE _____	REASONS FOR REJECTIONS (IF ANY)
Prepared By H O D Signature _____ Date 01.04.04	Approved by CEO Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-10]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.		PAGE NO. 11
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE		DATE : 01.04.04

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

MILK POWDER BACTERIOLOGICAL ANALYSIS REPORT SR.NO._____

DATE	PARTICULARS	BATCH NO	BAG NO.	PCT	COLI./g	NO. OF COLONIES		SPC/gm.	THERMO-PHILES/g	S. AUREUS/ 0.1 g'	BACILUS CEREUS/gm.	SALMONELLA & SHIGELLA/50g.	REMARKS
						10-2	10-3						

NAME OF BACTERIOLOGIST_____

SIGNATURE_____

PCT. - PRESUMPTIVE COLIFORM TEST
SPC. - STANDARD PLATE COUNT
COLI. - COLIFORM

Prepared By H O D	Approved byCEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-11]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.	PAGE NO. 12
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE	DATE : 01.04.04

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

BACTERIOLOGICAL ANALYSIS OF INDIGENOUS PRODUCTS

Sr. No.

SR. NO.	DATE	PRODUCT	DATE OF PRODUCTION	BATCH NO.	SPC/g.	COLI./g.	YMC/g.	REMARKS

NAME OF BACTERIOLOGIST_____

SIGNATURE _____

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-12]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

AIR - ENVIRONMENT AND EMPLOYEE'S HYGIENE - BACTERIOLOGICAL REPORT

Sr.No. _____

DATE_____

Sr. No.	PARTICULARS	TIME	AERIAL FLORA PER CUBIC FT.		COLIFORM	REMARKS
			SPC	Y&M		
1	SIFTER ROOM					
2	SIFTER GALLERY					
3	PACKING MATERIAL ROOM					
4	DEHUMIDIFIER LOCATION					
5	1 KG POWDER PACKING ROOM					
6	BUTTER MAKING ROOM					
7	BUTTER PACKING ROOM					
8	BUTTER GALLERY					
9	BUTTER COLD STORE					
10	IND.PRODUCT PACKING ROOM					
11	SWAB (WORKERS)					
i)	SIFTER ROOM					
ii)	INDIGENOUS PRODUCTS					
iii)	BUTTER PACKING					
iv)	1 KG POWDER PACKING ROOM					
v)	SFM FILLING ROOM					

NAME OF BACTERIOLOGIST_____

SIGNATURE_____

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-13]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

PLANT STERILITY REPORT

SR.NO._____

Sr.No.	DATE	PARTICULARS	TIME	SPC/900 sq.cm.	COLI./gm.	REMARKS

NAME OF BACTERIOLOGIST_____

SIGNATURE_____

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 01 Date 01.04.04

[QMS-14]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.	PAGE NO. 15
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE	DATE : 01.04.04

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

EFFLUENT TREATMENT PLANT ANALYSIS REPORT SR.NO._____

DATE	SOURCE	COLOUR	PH	TURBIDITY	TOTAL SOLIDS (PPM)	TOTAL DISSOLVED SOLIDS (PPM)	TOTAL SUSPENDED SOLIDS (PPM)	OIL & GREASE (PPM)	COD (PPM)	BOD (PPM)	REMARKS

NAME OF SHIFT CHEMIST /BACTERIOLOGIST _____

SIGNATURE_____

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 0 1 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-15]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTI DATE _____

OUTWARD GATE PASS(RAW MILK VEHICLES SHIFT _____

SUPPLIERS NAME :_____ ARRIVAL TIME _____

VEHICLE NO.: _____ TIME OF GATE -

PASS ISSUE _____

TIME (SAMPLE DRAWN) _____

	REJECTED / ACCEPTED
STATUS	
REASON FOR REJECTION (IF ANY) : _____	

TANKER :- CLEANED / SANITIZED

SIGN. OF SHIFT CHEMIST SIGN. OF SUPPLIER OR HIS REPRESENTATIVE

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

RAW MILK CLEARANCE SLIP

DATE:..... SHIFT.....

SR. NO	TANKER NO	SOURCE	TIME OF ARRIVAL	TIME OF TESTING	GRADE	RMT	P.TANK	SILO
1								
2								
3								

NAME OF CHEMIST/LAB. ASSTT._____

SIGNATURE_____

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-17]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.	PAGE NO. 18
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE	DATE : 01.04.04

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

STERILIZED FLAVOURED MILK

SR.NO._____

DATE OF PRODUC-TION	TYPE	BATCH NO.	COL-OUR	TASTE/ FLAVOUR	ACCELERATED SHELF LIFE AT 55 ° C						REMARKS
					Ist DAY	2nd DAY	3rd DAY	4th DAY	5th DAY	6th DAY	

NAME OF BACT./ SHIFT CHEMIST _____

SIGNATURE : _____

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-18]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.	PAGE NO 19
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE	DATE : 01.04.04

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

LINE TESTING OF MILK PRODUCTS

SR.NO._____

DATE	PRODUCT	TIME	PARTICULARS	DILUTION USED	SPC/g.	THERMO-PHILES /g	YMC/g.	COLI/g.	REMARKS

NAME OF BACTERIOLOGIST_____

SIGNATURE : _____

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-19]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

BACTERIAL CULTURE ACTIVITY REPORT

DATE	TYPE OF BULK CULTURE	ACIDITY %	ACTIVITY	PROPAGATION OF CULTURE	DATE OF INCUBATION	NOS. OF FLASK/TUBES

NAME OF BACT._____

SIGNATURE _____

FREQUENCY OF SUBCULTURING

1. MOTHER CULTURE-ONE MONTH(IN SINGLE)
2. STOCK CULTURE - 15 DAYS (DUPLICATE)
3. 1ST INTERMEDIATE-7 DAYS (DUPLICATE)
4. 2ND INTERMEDIATE-7 DAYS (DUPLICATE)
5. 3RD INTERMEDIATE-DAILY

ACTIVITY AND ACIDITY OF EACH LOT OF BULK CULTURE TO BE DONE

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-20]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.	PAGE NO. 21
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE	DATE : 01.04.04

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

WEIGHTS OF FINISHED PRODUCTS

DATE_____ PRODUCT_ _____

TIME	AVERAGE TARE WEIGHT	GROSS WEIGHT	NET WEIGHT	DESIRED WEIGHT	VARI ATION	REMARKS	SIGN.OF Q.A.	SIGN.OF S.I.

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

(QMQ-21)

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.	PAGE NO. 22
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE	DATE : 01.04.04

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

DETAILS OF COMPLAINT RECORD

SR.NO._____

SR. NO.	DATE	NAME & ADDRESS OF COMPLAINTANT	TYPE OF COMPLAINT	ANALYSIS	PREVENTIVE /CORRECTIVE ACTION	SIGN.OF Q A	SIGN.OF PROD.

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-22]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

RICE HUSK ANALYSIS REPORT

Sr.No. _____ _____

SR. NO.	AND TIME	SHIFT	VEHICLE N NO.	DUST % Not More Than R-4 W & S - 4	MOISTURE % Not More Than R-12 W & S -10	REMARKS	SIGN OF CHEMIST

NAME OF LAB.ASSTT./CHEMIST_____

S=SUMMER
W=WINTER
R=RAINY SEASON

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

SMALL PACKING ANALYSIS REPORT

BATCH NO_____ S.M.P/D.W_____

DT. OF PACKING	DT. OF PRODUC-TION	TYPE OF PACKING	LOT NO./ BATCH NO.	TIME	T/F	COLOUR	MOIS - TURE %	B.D.	SEDI-MENT	ACIDITY %	FAT %	ASH % (DB)	SIGN OF CHEMIST/ LAB ASSTT.

Prepared By H O D	Approved byCEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-24]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

ICE CREAM ANALYSIS REPORT

Date _____

SR. NO.	VARIETY PARTICULARS	ICE CREAM MIX						
1	T/F							
2	COLOUR							
3	ACIDITY %							
4	FAT %							
5	TOTAL SOLIDS %							
6	PROTEIN %							
7	BATCH NO.							
TOTAL SOLID								
a)	Wt. of Disc.							
b)	Wt. of Sample							
c)	Wt. after evapora-							
	tion							
d)	T.S.%							

NAME _____ SIGNATURE OF CHEMIST/LA

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-25]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

COLD STORAGE TEMP. REPORT

DATE: _____

TIME	LIQUID COLD STORAGE	ICE CREAM COLD STORE	GHEE GRANULA-TION ROOM	SIGN. QC	SIGN PROD.
DESIRED TEMP.	-2 to +2°C	-20 to -30°C	18 to 20°C		

Frequency - 2 hrs.

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-26]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

MBR TEST REPORT

DATE	SR.NO	SHIFT	BATCH NO.	CORK NO	SOURCE	TYPE OF MILK	INITIAL TIME	FINAL TIME	MBR TIME	SIG. OF CHEMIST/ASSTT.	REMARKS

Prepared By H O D Signature _____ Date 01.04.04	Approved by CEO Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD. | PAGE NO. 28

TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE | DATE : 01.04.04

DAILY QUALITY ASSURANCE REPORT

RAW MILK RECEIPT

SR. NO.	PARTICULARS	TANKER NO.	TEMP. DEG.C. (MAX)	TASTE & FLAVOUR	ACIDITY%	COB ALC	SODIUM PPM (10%)	MBR TIME	ADULT -RANT	FAT%	SNF%	GRADE
1	DESIRABLE NORMS		6	Normal	.117 to .144	- Ve						
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												
33												
34												

FLUID MILK ANALYSIS

TYPE OF MILK	DESIRABLE NORMS FAT %	SNF %	MBRT	TEMP.OF POUCH MILK	FAT %	SNF%	MBR TIME
FCM	6.10	9.20	SUMMER				
SM	4.60	8.70	6.30 Hrs.				
TM	3.10	8.70	WINTER				
DTM	1.60	9.20	7.0 Hrs.				
S/M	0.05	8.90					

GHEE ANALYSIS

PARTICULARS	MOISTURE	T/F	SEDIMENT	BR	RM	PV	COLOUR/
NORMS	0.25%						
FT1							
FT2							
FT3							

POWDER ANALYSIS

PARTICULARS	DESIRABLE NORMS						REMARKS
BATCH NO.							
T/F	NORMAL						
MOISTURE %	3.4 TO 3.6						
BD							
IN.l(ml)	0.5(Max.)						
SEDIMENT	Disc A						
FAT%	1.0 (Max.)						
ASH%	8.2 (Max.)						
SODIUM (PPM)	650						
Total Protein(ODB)	37%						

INDIGENOUS PRODUCT ANALYSIS

PRODUCTS	BATCH NO.	T/F	SEDIMENT	ACIDITY%	FAT%	SNF%	TS%

Prepared By H O D

Signature _____ Date 01.04.04

Issue No. 01 Date 01.04.04

Approved by CEO

Signature _____ Date 01.04.04

Revision No. 0 Date 01.04.04

[QMQ-30]

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.	PAGE NO. 29
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE	DATE : 01.04.04

BACTERIOLOGICAL ANALYSIS

Sr. No.	PARTICULARS	DATE OF PRODUCTION	BATCH NO.	BAG NO.	SPC/g	COLI/g	THERMOPHILES/g	Y & M/g	REMARKS

CHEMIST GM(T)

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

[QMQ-30 -A]

273

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

DAILY QUALITY CLEARANCE CERTIFICATE

PROD./STORE

Sr.No._____

Date : _____

SHIFT : _____ Time : _____

S.No.	PRODUCT NAME	DATE OF MANUFACTURING	Batch No. \Code	QUANITITY	STATUS

EXEC./CHEMIST

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

(QMQ 31)

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.	PAGE NO. 31
TITLE:- DEPARTMENTAL PROCEDURES QUALITY ASSURANCE	DATE : 01.04.04

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD. Sr.No. ____

NON CONFORMANCE OF PRODUCTS

SR. NO.	DATE	PRODUCT NAME	BATCH NO.	QUANTITY	DEVIATION	CORRECTIVE ACTION	PREVENTIVE ACTION	SIGNATURE OF COMMITTEE

Prepared By H O D	Approved by CEO
Signature _____ Date 01.04.04	Signature _____ Date 01.04.04
Issue No. 01 Date 01.04.04	Revision No. 0 Date 01.04.04

QMQ-32

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.	
OUTWARD GATE PASS (RAW MILK VEHICLES)	ACCEPTED
PRODUCT	
PACK SIZE	
BATCH NO.	
DATE OF MFG.	
QUANTITY	

CHEMIST/EX./D.M.(QA)

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

Quality Assurance Department

Objectives: - Consistency in quality of milk and milk products.

Sr. No.	Implementation Task	Frequency	Test/Checks to be performed by	Observation/ Variation	Remarks (Action taken by)
1.	Ensure calibration of bytyrometers, lactometers, thermometers and pipettes.	Every lot	Chemist	Exec.(Q.A.)	H.O.D. (Q.A)
2.	Counter sample of each product to be checked for accuracy of testing.	Once in 24 Hrs.	Chemist	Exec.(Q.A.)	H.O.D.
3.	To carry out audit of cleaning schedules of processing, indigenous and powder plant on daily basis/shift wise.	In each shift	Lab.Asstt.	Exec.(Q.A.)/ Ex. (Microbiologist)	H.O.D.
4.	Processing parameters of each product is to be checked at regular interval.	Each shift	Lab.Asstt.	Exec.(Q.A.)	H.O.D.
5.	Each finished product is to be checked for compliance of PFA/ISI/AGMARK/IBI specifications.	(Hourly obervation)	Chemist	Exec.(Q.A.)	H.O.D.

Objectives: - Customer Satisfaction.

Sr. No.	Implementation Task	Frequency	Test/Checks to be performed by	Observation/ Variation	Remarks (Action taken by)
6.	Quality certificate for each product is to be issued that product conforms to MSL specifications and statutory norms.	For all products	Chemist	Exec.(Q.A.)	H.O.D.
7.	Ensure that raw milk and each product is checked organoleptic attributes.	Every week Monday	Committee Analyst	Exec.(Q.A.)	H.O.D.
8.	To carry out testing of competitor's liquid milk samples for all parameters on weekly basis.	Every week	Chemist	Exec.(Q.A.)	H.O.D.
9.	Ensure that becteriological quality of each product conforms to MSL norms.	As per schedule	Ex.(Micro-biology)	Ex.(Micro-biology)	Ex.(Micro-biology)
10.	Carry out line testing of each product as per specified frequency.	As per schedule	Ex.(Micro-Biology)	Ex.(Micro-biology)	Ex.(Micro-biology)

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

Quality Assurance Department

Objectives: - R & D for improving quality of milk & milk products.

Sr. No.	Implementation Task	Frequency	Test/Checks to be performed by	Observation/ Variation	Remarks (Action taken by)
11.	Premium products of other brands should be analysed for chemical and bacteriological parameters tests and compared with MSL products on periodic basis.	Once in a month	Executive (Q.A.)	Committee members	Good aspect to be incorporated in our product.
12.	Packaging materials of competitor's be analysed for all parameters on periodic basis.	After six month	Executive (Q.A.)	All legal as	Good aspect to be incorporated in our product
13.	To conduct R & D to improve the quality of existing products.	Once in a month.	Executive (Q.A.)	Match and improve upon charact	Good aspect to be incorporated in our product

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

Quality Assurance Department

Objectives: - Compliance of Statutory Regulations.

Sr. No.	Implementation Task	Frequency	Test/Checks to be performed by	Observation/ Variation	Remarks (Action taken by)
14.	To carry out shelf life study of each product and liquid milk.	Monthly	Chemist	Executive (QA)	H.O.D.
15.	Quality certificate is to be issued for each product before final packaging.	Each shift 8 hours	Chemist	Executive (QA)	H.O.D.
16.	All equipment of laboratory must be calibrated as per specified frequency.	Monthly	Ex. (Engg.)	Executive (QA)	H.O.D.
17.	Ensure timely renewal of licence BIS/AGMARK/ISO-9002 System/ F.P.O. Export licence.	Once in a year	Ex. (Egg.)	Executive (QA)	GM(W)

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

Quality Assurance Department

Objectives: - Compliance of ISO and Statutory Regulations.

Sr. No.	Implementation Task	Frequency	Test/Checks to be performed by	Observation/ Variation	Remarks (Action taken by)
18.	To maintain daily records for SMP/WMP as per performance of BIS	Daily	Chemist	Regular	H.O.D.
19.	Maintain all relevant records of production and packing of ghee as per AGMARK rules.	Daily	AGMARK Chemist	Monthly	H.O.D
20.	To ensure that stamping of all balances, filling machines, weigh bridge as per Weights and Measures act.	Once in a year	Executive (Engg.)	Regular	GM(W)
21.	To ensure that all products conform to P.F.A. regulations.	Each Shift	Chemist	Regular	H.O.D
22.	To carry out strength of detergents at the specified intervals.	Daily	Chemist	Regular	H.O.D
23.	To evaluate the pasteurizer's graphs on daily basis to monitor the critical temp. Of milk pasteurization.	Daily	Executive (Q.A.)	Regular	H.O.D
24.	To check the calibration of weighing scales of production department on periodic basis.	Weekly basis	Executive (QA)	Weekly	H.O.D

INNOVATIVE BUSINESS IMPROVEMENTS (PVT.) LTD.

Quality Assurance Department

Objectives: - Compliance of ISO and Statutory Regulations.

Sr. No.	Implementation Task	Frequency	Test/Checks to be performed by	Observation/ Variation	Remarks (Action taken by)
25.	To check the cleanliness of production department on shift basis to ensure that cleaning schedule are strictly being followed.	Each shift	Chemist	Regular	H.O.D
26.	To Conduct MBR test for different categories of milk at specified intervals.	Each shift	Chemist	Regular	H.O.D
27.	To critically monitor HACCP parameters for each product at specified intervals.	Each shift	Chemist	Regular	H.O.D
28.	Ensuring timely corrective/ preventive steps on the basis of market feed back and consumer complaints. Monthly review for monitoring effectiveness of system.	Monthly basis	Executive (Q.A.)	Regular	H.O.D