SRI SHANMUGHA COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved By AICTE, Accredited by NAAC, Affiliated to Anna University)

Tiruchengode – Sankari Mani Rd, Pullipalayam, Morur (PO), Sankari (Tk), Salem 637304.

AI8614 – FOOD PROCESS ENGINEERING LABORATORY

DEPARTMENT OF AGRICULTURE ENGINEERING

Anna University - Regulation: 2017

B.E AGRICULTURE ENGINEERING – VI SEMESTER

AI8614 –FOOD PROCESS ENGINEERING LABORATORY

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RECORD NOTE BOOK

REGNO. _____

Certified that this is a bonafide observation of Practical work done by Mr/Ms/Mrs……of the…… Semester……. Branch during the Academic year……in the……laboratory.

Staff–in–Charge **Head of the Department**

Internal Examiner **External Examiner**

GENERAL INSTRUCTIONS

- All the students are instructed to wear protective uniform and shoes before entering into the laboratory.
- Before starting the exercise, students should have a clear idea about the principles of that exercise
- All the students are advised to come with completed recorded and corrected observation book of previous experiments, defaulters will not allowed to do their experiment.
- Don't operate any instrument without getting concerned staff member's prior permission.
- All the instruments are costly. Hence handle them carefully, to avoid fine for any breakage.
- Almost care must be taken to avert any possible injury while on laboratory work. In case, anything occurs immediately report to the staff members.
- One student from each batch should put his/her signature during receiving the instrument in instrument issue register**.**

LIST OF EXPERIMENTS

S.No	Date	Name of the Experiments	Page No	Mark Obtained	Faculty Signature

EXPT NO: 1

DATE:

ESTIMATION OF MICROBIAL LOAD IN FOOD MATERIALS BY AEROBIC PLATE COUNT

AIM:

To estimate the microbial load in food materials by aerobic plate count.

INTRODUCTION:

Microbial spoilage occurs in foods due to improper handling, storage and preservation materials and results in the deterioration of quality of production and spoilage due to the toxins present. Different groups of microorganisms are present in the foods. They increase in numbers during storage. The aerobic plate count (APC) is intended to indicate the levels of microorganism in a product. Only aerobes are expressed these counts. The presence of other spoilage microorganism may be assessed by specialized methods.

MATERIALS REQUIRED:

1. Food samples (fresh and spoiled)
2. Food sampler, pulper etc..,
3. Plate count agar media ,potato dextrose agar ,yeast glucose chloramphenicol agar media
4. Sterile pipettes, petri dishes, etc..,
5. Sterile water plants.

PROCEDURE:

- Homogeneous the collected food samples in a sterilized waring blender.
- Prepare serial dilutions of the sample based on the type of microorganism to be assessed.

  Eg:10^5 & 10^6 for bacteria ,10^3 and 10^4 for fungi and yeast
- Take 1ml of the diluted and transfer aseptically to sterile petri plates.

- Allow the media to solidify
- Incubate the plants at room temperature (28^0+2^0) in an inverted position
- Observe the plates for the development of bacterial (within 2-3 days)
- Record the morphology and population of microbes in the plates
- Pour lukewarm sterile plate count Agar (for bacteria), potato dextrose agar (for fungi) and yeast glucose chloramphenicol agar (for yeast) in the respective plates.

RESULT:

Estimation of microbial count in food material by aerobic plate count was determined as----------

EXPT. NO: 2

DATE:

ESTIMATION OF PROTEIN BY LOWRY'S METHOD

AIM:

To estimate the amount of protein present in given unknown solution.

PRINCIPLE:

Alkaline CuSO4 catalyses the oxidation of aromatic amino acids with subsequent reduction of sodium potassium motybolate tungstate of Folin's reagent giving a purpose cooler complex the intensity of the colour is directly proposition to the concentration of the aromatic amino acid in the given sample solution.

REAGENTS REQUIRED:

1. **STOCK SOLUTION:**

Bovine serum albumin of 100mg is weighed Bovine serum accurately and dissolute in 100ml of distilled water in a standard flask concentration (Hg/ml)

2. **WORKING STANDARD:**

The stock solution of 10ml is distilled to 100ml with distilled water in a standard flask concentration 100mg (ml).

3. **FOLIN'S PHENOL REAGENT:**

Folin's phenol reagent is mixed with distilled water in the ratio 1:2.

4. **ALKALINE COPPER REAGENT:**
   i. Solution A,2% sodium carbonate in 0.1N **Sodium Trydroxide.**
   ii. Solution B,0.5% copper sulphate in 1% sodium potassium tertarate.
   iii. Solution A, B, C is mixed in the proportion of 50:1:0.5

UNKNOWN PREPARATION:

- The unknown proteins is made upto 100ml with distilled water.
- D reagent 1:48ml of A, 1ml of B, 1ml of C.
- E reagent 11-1 part folin-phenol (2N) : 1 part water**.**

PROCEDURE:

- Working standard of 0.2-1 ml in pipette into clean test tube and labelled as S1-S2.
- Test solution of 0.2ml is taken into test tube and labelled as T.
- The volume is made upto 1ml of distilled water.
- Distilled water 1ml serves as blank.
- To all the test tube 4.5ml of alkaline. CUSO4 reagent is added and incubated at room temperature for 1o mins.
- All the tube 0.5ml of Folin's phenol reagent is added.
- The contestsare mixed well and the blue colour developed is read at 6400rpm after 15 mins.
- From the standard graph the amount of protein in the given unknown solution is calculated.

RESULT:

1. The amount of protein present in the given unknown solution(1) is

2. The amount of protein present in the given unknown solution (2) is

EXPT.NO: 3

DATE:

DETERMINATION OF COOKING PARAMETERS OF PARABOILED RICE

AIM:

To determine the cooking properties of parboiled and raw rice.

PRINCIPLE:

The cooking quality of rice is influenced by the gelatinization and retrogradation characteristics of its starch the range for high amylose containing rice was generally from 15-35%.The rice grains becomes dry and becomes firm upon cooking the rice varieties having amylose content cook wet and sticky.

PARABOILING:

Rough rice or rice paddy samples (1KG to 50kg) were soaked in beaker containing water and placed in a water bath at 60°C for a time period of 7-8hrs after soaking samples were quickly withdrawn washed and cooled to room temperature and dried in trays with moisture content up to 10-12% remaining.

PROCEDURE:

RICE COOKING:

To study the effects of cooking 15g of parboiled and raw rice were soaked separately in a beaker containing distilled water for 1hrs and then cooked for 100°C.

GRAIN DIMENSIONS:

Grain dimensions were determine using general vernier caliper. Ten grains from each sample were collected at random and the dimension were measured.

GRAIN SHAPE:

- Based on the length to width ratio (L/W) the shape of the milled rice was determined,
- (L/W) ratio is calculated follows,

(L/W) = (avg length of rice mm/avg width of rice mm).

DENSITY:

This was determined by the Pycnometer method according to AOAC (1990).

Density=weight of rice/volume of rice

Where,

I. Volume of rice=volume of replaced/water
II. Volume of replaced water=$(m_1+m_2)-m_3$/density of water

Where,

M_1=weight of rice

M_2=weight of Pycnometer filled with water

M_3=weight of Pycnometer + weight of rice + water.

1000 KERNAL WEIGHT:

The 1000 kernal from each sample were counted randomly in triplicate and weight separated to determine 1000 kernal weights.

BROKEN RATIO:

Broken ratio is determined by using then grain grader.

% Broken= (Wt of broken grains/ Wt of sample) *100.

MINIMUM COOLING TIME (MCT):

A mass of 5g rice grain from each sample was cooked in boiling distilled water (100ml) at 100±1°C in a water both the measurement involved collection of 10 grains from the cooking vessel and pressing between two glass slides .The times when minimum of 95% of two collected boiling grains no longer displaced opaque core.

ELONGATION RATIO:

It was determined by measurement of 10 cooled grain by cumulative length of 10°uncooked grains.

COLOUR CHARACTERISTIC:

Colour parameter (l*,a*,b*) of uncooler and cooked rice grains samples were determined using a spectrophotometer. The instrument was calibrated with a black and white standard plate before analysis.

L*=lightness

A*=redness

B*=yellowness

Mean and standard deviation of four replications were reported.

GEL CONSISTENCY:

This was determined based on the consistency of milled rice paste that has been gelatinized by boiling in dilute alkali and then cooled to room temperature. Tubes were laid horizontally on a table lined with millimeter graph paper and total length of the gel measured in mm.

RESULT:

The cooking properties of raw rice and parboiled rice were determined and tabulated.

EXPT NO: 4
DATE:

EXPERIMENT ON OSMOTIC DEHYDRATION OF FOODS

AIM:

To study about osmotic dehydration of foods. The osmotic dehydration consists of food immersion in hypertonic solution (Eg: salt, sugar, glycol).

PRETREATMENT:

Immersion of product in alkaline (or) acid solution of oleate prior to drying of fruits affected the prevention of discoloration.

IMMERSION TIME:

Keeping the concentration of the solution constant, the increase of the immersion time resulted in increase of water loss, but the rate of increase was decreased. Studied on the optimization duration of osmosis process that indicated that mass exchange.

TEMPERATURE OF THE OSMOTIC SOLUTION:

The temperature of the osmotic solution markedly affected the rate of osmosis. Although the rate increased with temperature, it was limited upto 60^0C as higher temperature destroyed the cell membrane.

OSMOTIC AGENTS:

The most commonly used osmotic agents were sucrose, glucose for fruits and NaCl for vegetables. Other osmotic agents include CaCl, Monohydroxy ethanol and polyhydroxy compounds such as lactose, malt dextrin, corn syrup and mixtures of these items.

PROCEDURE:

Osmotic dehydration removes water partially from fruits (or) vegetables immersed in a hypertonic solution. During osmotic processing water yellow from the product into the osmotic solution, whereas osmotic solute into the product such as tissue depends upon the factors such as temperature and concentration solution, the size and geometry of the material the solution to material mass ratio, and the limit of agitation of the solution.

PREPARATION OF SAMPLES:

Bananas were peeled and with the help of a cutting desire banana slice were produced. An experimented group was immersed in the osmotic solution of given concentration and temperature during a given period of time. Equipment were performed with the same constated continuously with a constant magnetic stirrer, thus enhancing equilibrium conditions.

In the experiments made to estimate the mass transfer co-efficient of the estimate dehydration process, the sample were kept in the dehydration process, the sample were kept in the osmotic solution for 0.5, 1.0, 2.0, 3.0 & 0.4 hrs. The temperature and concentration of the solution was mentioned throughout each experiments. High temperature (50-70^{0}C) were used to increase the mass transfer of water from the first to the osmotic solution.

After the end of the sir-drying process, all cylinders of each group had their weight and moisture measured individually.

Moisture content (Wb%) = (Initial weight + Final weight)/(initial weight)

Every 15 minutes, the bananas were weighed in order to calculate its moisture content by mass balance.

RESULT:

The moisture changes during osmotic dehydration of food were studied.

EXPT.NO: 5

DATE:

DETERMINATION OF REHYDRATION RATIO OF DEHYDRATED FOODS

AIM:

To determine the rehydration ratio of dehydrated foods.

INTRODUCTION:

Drying is one of the oldest & most widely used methods of food preservation. The dried products will be acceptable for food only if a good colour, texture & flavour are resumed.

FLUDIZED BED DRYING:

One of the promising drying processes is drying of mined vegetables in a fluidized bed, due to better heat & mass transfer, shorter during time, better quality of products obtained & shorter reconstitution time.

EXPERIMENTAL METHODS:

The potatoes were peeled & cut into slices with different thickness. One portion becomes the boiling water for 5 mins. Each part was dried in fluidized bed dryer 60℃ for 45 hours. The dehydrated samples were rehydrated in water. The slices were weighed & then subjected to rehydration for the rehydration test, 20mins was found to be optimum time as here was no significant weight gain after 20mins.

REHYDRATION PROPERTIES:

DETERMINATION OF DEHYDRATION RATIO:

The dehydration ratio of the dried product was calculated by the following formula.

$$\text{Dehydration Ratio} = \frac{\text{Weight of prepared material before drying}}{\text{Weight of dried Material}}$$

PERCENT WATER IN REHYDRATED MATERIAL:

The percentage of water in rehydrated material was determined by the following formula.

$$\text{Percent water in rehydrated material} = \frac{\text{Drained weight of rehydrated material} - \text{(Dry mater content in sample taken for rehydration)}}{\text{Weight of dehydrated material}} \times 100$$

RESULT:

The rehydration ratio of dehydrated food was determined.

EXPT. NO: 6

DATE:

EXPERIMENT ON PROPERTIES OF FOOD THROUGH MICROWAVE OVEN HEATING

AIM:

To determine the properties of food through microwave oven heating.

INTRODUCTION:

Moisture content is one of the most commonly used measurements in food processing and testing. Because moisture content is related to the alternations taking place during storage and processing and affects the final quality, it is of direct economic importance to food manufacturers and consumers. Fast and easy evaluation.

METHOD:

Undamaged, fresh, ripe fruits & vegetables were taken. After the products had been washed &cooled, the inedible portions were removed and remainder grated to yield pieces about 2mm thick. The grated material was taken & homogenized. Different moisture determination methods. Conventional vacuum & microwave oven were taken from a single batch, prepared as described above.

To study the effect of sample weight, three petri dishes were then loaded with a single sample of 40g of product and then each was placed in turn centre of the oven, drying over the time was measured at the end of each 5 mins interval, until it was constant.

The sample was dried in a conventional forced air oven at 50°c for 12 hour followed by an additional 3 hours at 105°c until sample weight become constant.

Three determinations were performed for each product, sample weight and drying method used.

The changes in weight over drying time in the microwave oven for the fruits & vegetables tested. The moisture content in percent was calculated from the weight loss.

$$\text{Moisture content} = \frac{\text{Initial weight} - \text{Final weight}}{\text{Initial weight}} * 100$$

RESULT:

The properties of food through microwave oven heating were studied.

EXPT. NO: 7
DATE:

EXPERIMENTS ON CREAM SEPERATOR TO DETERMINE THE SEPARATION EFFICIENCY

AIM:

To determine the separation efficiency of cream separator.

INTRODUCTION:

Separation of cream is carried out to get cream from milk for manufacturing fat rich products such as butter, ghee. On the other hand, skimmed milk, obtained for preparation of casein, whey protein, lactose etc. Separation of cream is done by centrifugal method. Since milk particles are heavies, they assume a position below the milk fat particles which rise to top. In this way, rising of fat globule takes place and a cream layer is formed at the top of the milk.

EXPERIMENT:

PRINCIPLE:

The cream separator works on two principles. Firstly, on difference in densities of milk constituents and secondly on centrifugal force.

By Strone's law

$$V = 2gr (ds-df) / gh$$

Where,

V – Velocity of movement of fat globules in cm/s.

g - Gravitational force as 981 cm/sec.

d_s – Density of skim milk -1.036 to 1.040 g/cu.atm

d_f - density of fat 0.93g/cu.cm

r - Average radius of fat globules in cm.

h - Viscosity of milk in poise.

Stroke's law applies to centrifugal separation is,

$$V = r' r (ds-df) N.N.R.K/h$$

Where,

N – Speed of bowl in rpm

R – Distance of fat globule from the axis of rotation in cm.

K - Constant

SKIMMING EFFICIENCY

It refers to the % of total fat from milk recovered in cream.

$$SE = \frac{C*F/100}{M*F/100} * 100$$

Where,

C – Amount to cream (kg)

F – Fat percentage in cream

F1 – Fat percentage in milk

M – Amount of milk (kg)

YIELD OF CREAM

This can be calculated by the formula.

FAT LOST IN MILK:

This can be calculated by the formula,

$$\% \text{ fat loss in skim milk} = \frac{\text{Kg fat in skim milk}}{\text{Kg fat in milk}} * 100$$

$$= \frac{fc - fm}{fc - fs} * \frac{fs}{fm} * 100$$

REQUIREMENTS:

Cream separators, spanner set, screw driver, bowl wrench, disc transfer rod, separator oil, tray, milk cans etc.

PROCEDURE:

1. Assemble the parts of the cream separator bowl properly & tighten is with the bowl screw nut.
2. Put the spouts of cream & skim milk over the bowl & proper places.
3. Fix properly the assembled bowl into the spindle of the cream separator.
4. See the cream or skim milk screw is in normal position.
5. Pour about 5-10 lit of hot water and flush it out through the separator.
6. Receive cream and skim milk separately in clean, dry cans of known weight.
7. Dismantle the bowl.
8. Clean and sanitize all parts properly & leave them to dry.
9. Determine percent fat in milk, cream and skim milk and percent, acidity in milk.

RESULT:

The separation efficiency of cream separated was studied.

EXPT NO: 8

DATE:

EXPERIMENTS ON CONSTRUCTION AND OPERATION OF BUTTER CHURN AND WORKING ACCESSORIES

AIM:

To study about the construction and operation of butter churn and working accessories.

INTRODUCTION:

Butter is essentially the fat of the milk. It is usually made from, sweet cream and is sateed. The natural struing process is however a very sensitive one and infection by foreign microorganism often spoiled the result.

The principle constituents of a salted butter are fat (80-20), water (15.6-17.6%) salt about (2-3%) and residual curd (about 1.5%), the consistency should be smooth so that the better is easy to spread and melts readily on the tongue.

MATERIALS REQUIRED:

- ✓ Metal churn
- ✓ Cream strainer, Platform balance
- ✓ Butter moisture balance with accessories
- ✓ Fat and acid testing set along with standard solution
- ✓ Sampling both and sampling device
- ✓ Good quality and chived water and cream

PROCEDURE:

(A) Constructional features:

Type of churn, hand/power operated

i. Metal wooden
ii. Cylindrical conical
iii. Roller type.1 Role-less type
iv. Front opening / side opening

- Make and capacity of churns
- Fittings provided
- Lubrication procedure
- Special sanitary constructional features

(B) Operation of butter churn:

i. Run scalding water into the churn at 90-95°c till it is one fifth full.
ii. Revolve the churn for about 15min.
iii. Stop the churn for and runoff the scalding water.
iv. Revolve the churn with cold water for 10min.
v. Ventilate the cream a few min during early stage of churning.

BATCH – BUTTER CHURNS:

a) Rotating churns:

The rotating butter churns was introduced in the 19th century and gradually from farm butter making. It was a adopted for the factory butter making by butter industry.

b) Batch method using rotating churns:

The use of batch churns for butter manufacture is no decreasing trend because of increase in popularity of improved designs of continuous butter making machine.

The best condition for churning is maximum turbulence are achieved when the force of gravity just exceeds the centrifugal force.

ie., $mw^2R < mg$

$(2\pi n)^2R < g$

(or) $n < \left(\frac{g}{p}\right)^{1/2} . (\frac{1}{2\pi}) \approx \frac{1}{2\sqrt{R}}$

1. Loading the cream:

Pasteurized cream with 30-40 % fat properly aged is pumped into the churn cream is filled to 40 – 45 % of the volume of the churn.

2. Churning:

The churn can be operated at different speeds. The cream is churned at the churning speed (60-100 rpm). It takes about 35-40 min for the formation of butter granular of peanut size.

3. Butter milk Draining:

The churn is stopped and buttermilk is drained off equal quality of pasteurized wash water is added.

4. Washing:

The churn is started again the wash water is drained off after some time. Two or three washings are generally given.

5. Unloading and packaging:

The butter is unloaded in trolleys and then packed for sale. Different types of packing machines are employed for the required size & packages.

Care of churns:

(a) Driving gear should be filled with lubricating oil and every alternate year replace it.

(b) Solid foundation is necessary for churn and driving gears.

(c) Gaskets to be maintained leak proofs.

Batch type butter churns:

Pate of churn is to agitate the cream. Today's churn design is evolved over the time.

Dash churn:

Have agitator or Dash which rotates to convert cream into butter while they containing the vessel remains stationary. There are two major type of Dash churns. They are,

a) Plunger type
b) Rotating or Agitator type

1. Cubical
2. Cylindrical – conical
3. Double cone

Centrifugal force < force of gravity

Therefore, $m\omega^2 R < mg$

Where,

m- Mass

ω- Angular velocity

R- Radius of path

g – Gravitational acceleration

Since $\omega=2\pi n$

$$(2\pi n)^2 R < g$$

$$n < \left(\frac{g}{p}\right)^{1/2} . \left(\frac{1}{2\pi}\right)$$

So, $n < \frac{1}{2\sqrt{R}}$

Operation of Batch type churns:

1. Cool the cream after pasteurization to 10°C and maintain the temperature of cream b/w 10 to 13°C for overnight.
2. Churn should not be overloaded.
3. Spray the granules with a small amount of pasteurized chilled water.
4. For washing and chilling and enough pasteurized chilled water.
5. Revolve the churn in high speed.
6. Drain the water from the churn and then add the salt.
7. Work the butter thoroughly and complete the working.
8. Store the butter in a refrigerator at 4-7°C.

Result:

The construction and operation of butter churn and butter working accessories was studied.

EXPT NO: 9

DATE:

EXPERIMENT ON DETECTION OF ADULTERANT

AIM:

To detect the adulterants, present in the food.

DETECTION OF ADULTERANTS:

S.No	Food Particle	Adulterant	Method of detection
1.	Milk	Starch	Add a few drops of Iodine solution, formation of blue color indicates the presence of starch.
		Urea	Take a teaspoon of milk in a test tube and ½ teaspoon of soyabean on arhar powder, mix up of the contents thoroughly by shaking the test tube. After 5 min dip a red litmus paper. Remove the paper after ½ a min. A change in color from red paper to blue indicates the presence of urea in the milk.
		Vanaspathi	Take 3 ml of milk in a test tube. Add in the Drops of hydrochloric acid. Mix up one Teaspoon of sugar. After 5 min examine the mixture. The red coloration indicates the presence of vanaspathi in the milk.
		Formalin	Take 10ml of milk in a test tube and add 5ml of Conc. Sulphuric acid from the side of wall without shaking. If a violet (or) blue ring

			appears at the intersection of two layers, then it shows the presence of formalin.
2.	Honey	Sugar solution	A cotton wick dipped in pure honey when lighted with a match stick burns and shows the purity of honey. It adulterated, the presence of water will not allow honey to burn, if it does; it will produce a cracking sound.
3.	Ghee	Vanaspathi (or) margarine	Take about one teaspoon full of melted sample of Ghee with equal quantity of concentrated Hydrochloric acid in a stoppered test tube and add to it a pinch of sugar. Shake for one minute and let it for five minutes. Appearance of crimson color in lower(acid) of vanaspathi (or) margarine.
4.	Edible oil	Prohibited color	Take 5ml of sample in a test tube and add 5ml of concentrated hydrochloric acid. Shake gently, let it stand for 5 minutes, color will separate in the upper layer of the solution.
5.	Maida/ Rice	Bromic Acid	Take a small amount of sample in a test tube, add some water and shake. Add a few drops of HCl. Dip a turmeric paper strip if it turns red, boric acid is present.
6.	Chillies powder	Brick powder	To a little powder of chilli add small amount of concentrated Hcl and mix to the consistency of paste, dip the paste

			and hold over the flame, brick red flame color due to the presence of calcium salts in brick powder
7.	Vineger	Mineral acid	Test with the methyl yellow indicator paper, in case the color changes from yellow to pink, mineral acid is present.

RESULT:

The adulterate of the given sample is determined.

EXPT NO: 10

DATE:

DETERMINATION OF PROPERTIES OF MILK

AIM:

To determine the properties of milk includes fat, acidity and bacteriological of milk. Determination of fat content in milk using Gerber's method.

PRINCIPLE:

In this method fat alone in separated from milk by subjecting the milk to digestion by the addition concentrated Sulphuric acid and by process of centrifugation the fat is separated and measured.

APPARATUS REQUIRED:

1) Milk butyrometer
2) Acid pipette with safety bulb
3) Milk pipette
4) 1ml pipette
5) 10ml pipette
6) Regulating pin
7) Gerber's centrifuge

REAGENTS PREPARED:

1) Gerber's acid
2) Amyl alcohol

PROCEDURE:

- 10ml of Gerber's acid is pipette out into butyrometer carefully along the side.
- The 10.75ml of well mixed milk is pipette out and layered over the acid carefully so that there are two separate layers.

- Finally, 1ml of amyl alcohol is added the pipette should be used to close the butyrometer using cast drop.
- Adry rubber lock stopper without any crack should be used to close butyrometer using regular pin.
- The tube is then inverted several times, so that the acid in the stem and in the bulb is thoroughly mixed with the milk.
- The butyrometer is then placed in the centrifuge with the stem towards the center and the centrifuge is kept well balanced centrifuge is done at 1100 RPM for 5 min and removed from the centrifuge.
- The stopper is adjusted to bring the lower menisus of the fat column against "0" unit graduation. The lower menisus of the surface of the fat column is noted without any parallelex error which gives the fat percentage.

RESULT:

The percentage of fat in the given sample of cream is

EXPT. NO: 11

DATE:

DETERMINATION OF THE ACIDITY OF THE GIVEN SAMPLE OF MILK

AIM:

To determine the acidity of the given sample of milk.

APPRATUS REQUIRED:

Burette, Porcelain dish, 10ml pipette.

REAGENTS REQUIRED:

0.1N NaOH and Phenolphthalein indicator.

PRINCIPLE:

- Equal strength of alkali and acid will neutralize equal volume of each based on this principle the amount of alkali required to neutralize the acidity of milk is determined.

$$CH_3CHCOOH+NaOH \rightarrow CH_3CHCOONa+H_2O$$

- The molecular weight of lactic s=acid is 20g and 1N of lactic acid solution contains 90g of lactic acid in 100ml of water.

PROCEDURE:

10ml of milk is taken in the porcelain dish the burette is charged with N/10 NaOH solution .two (or) 3 drops of phenolphthalein. Indicator is added to the milk and is filtrated against the alkali to a pale pink which persist for 15 -30sec.

Acidity in percentage = $(9*V_1*N_1)/V_2$

RESULT:

The acidity of the given milk sample is determined.