

ANALYSIS OF VARIOUS FOOD PRODUCTS AND WATER SAMPLES

An Industrial Training Report submitted
for the partial fulfillment of the Degree of Master of Science

By

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[M.Sc.Microbiology Semester IV]



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2019-21

CERTIFICATE

This is to certify that this training report entitled “**Analysis of various food products and water samples**” was successfully carried out by **Mr. Keyur Vijaybhai Bhatt** towards the partial fulfillment of requirements for the degree of Master of Science in Microbiology of M.&N.Virani Science College, Rajkot. It is an authentic record of his own work, carried out by him under the guidance of **Mr. Divyesh Marviya** for a period of **3 Months** during the academic year of **2019-21**. The content of this report, in full or in parts, has not been submitted for the award of any other degree or certificate in this or any other University.

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DECLARATION

I hereby declare that the work incorporated in the present dissertation report entitled **“Analysis of various food products and water samples”** is my own work and is original. This work (in part or in full) has not been submitted to any University for the award of any Degree or a Diploma.



Date : 04/05/2021

Mr. Keyur Vijaybhai Bhatt

ACKNOWLEDGMENT

The training opportunity I had with Enviro Laboratories Pvt. Ltd. was a fantastic opportunity for me to learn and grow professionally. As a result, I consider myself extremely fortunate to have been given the opportunity to be a part of it. I'm also thankful for the opportunity to meet so many amazing people and professionals who guided me through my internship. In light of the above, I'd like to take this opportunity to express my heartfelt appreciation and special thanks to Mr. Sunil Sangani, Managing Director of Enviro Laboratories Pvt. Ltd., who, despite being extremely busy with his duties, took time out to listen, guide, and keep me on the right track, helping me to carry out my work at their prestigious organization and extending during the journey. It is my joyous sentiment to express my warmest regards and sincere appreciation to all members of the laboratory staff for their careful and valuable guidance, which was extremely beneficial for my work both theoretically and practically. This opportunity represents a significant step forward in my professional growth. I will make every effort to put my acquired skills and knowledge to the best possible use, and I will continue to focus on improving them in order to achieve my career goals.

Index

	Page no.
Abstract	3
List of Tables and Figures	4
Introduction	5
Methods	6
Conclusion	19
References	20

ABSTRACT

In this report 'Analysis of various food products and water samples' we perform various qualitative and quantitative methods like Total Plate Count , Yeast & Mould count , Membrane filtration method for detection of E.coli and coliforms , Swab Sampling , Moisture content measurement & Glycerol stock preparation to check the quality of food product or the water sample and to check the microbes present on the surface area.

List of Tables and Figures

- Figure – 1 :- Envitro Laboratories Pvt. Ltd.
- Figure – 2 :- Calculation of TPC
- Figure – 3 :- Result (Colonies) of TPC
- Figure – 4 :- Calculation of Yeast and Mould Count
- Figure – 5 :- Result (Colonies) of Yeast and Mould Count
- Figure – 6 :- Positive result on VRBL plate (Coliforms present)
- Figure – 7 :- Negative result on VRBL plate (Coliforms absent)
- Figure – 8 :- Positive result on EMB plate (*E.coli* present)
- Figure – 9 :- Negative result on EMB plate (*E.coli* absent)
- Figure – 10 :- Calculation of Moisture content measurement
- Figure – 11 :- Dry state of sample (after 2 hours in hot air oven)

Introduction

There are lots of microbes present in the environment. Some are our normal flora & some are harmful to us. For our survival we have to take food & water regularly. There is possibility of presence of pathogens in food and water. Those pathogens can harm our body. So we have to check the quality of those before consuming it. In this report 'Analysis of various food products and water samples' there are various methods by which we can check the quality of those & by the results we can conclude whether we can consume the product or not. We can also check number of microbes present on the surface are by method 'Swab Sampling' & can preserve pure culture by method 'Preparation of Glycerol stock' which are also included in this report.

Company profile :-

Envitro Laboratories Pvt. Ltd. Is a full Analytical & Testing & Research services Provider Company serving in the western India for Food, Beverage, Soil, Agricultural Products, Building and Construction materials testing and Environmental Pollution Monitoring. The Laboratory is located in Rajkot-Gujarat, where all the in house technical work is performed and conducted.



(1)

Methods

- Total Plate Count - IS 5402 (2012)
- Yeast & Mould Count - IS 5403 (1999)
- Membrane Filtration Method for detection of Coliforms - IS 1622 (1981)
- Membrane Filtration Method for detection of E.coli - IS 1622 (1981)
- Swab Sampling – ISO 18593 (2018)
- Moisture Content Measurement – FSSAI Manual
- Preparation of Glycerol stock

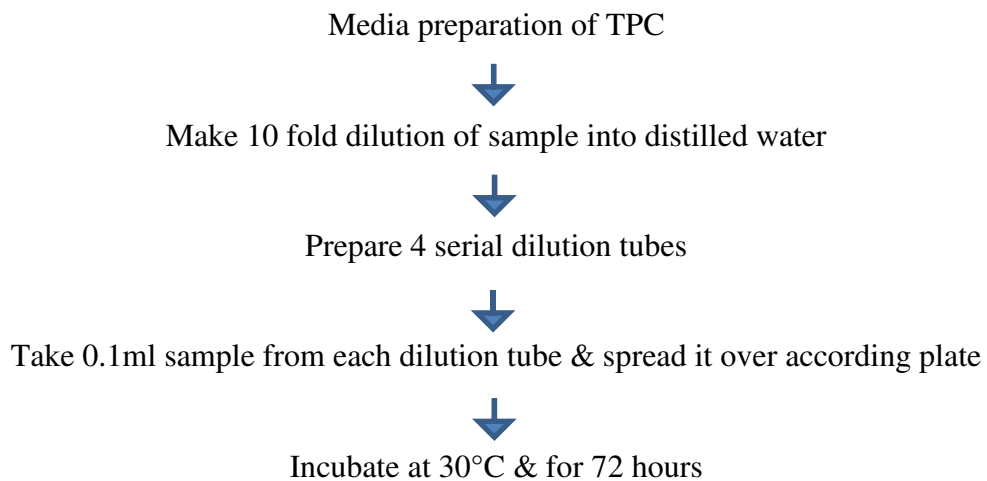
Total Plate Count

- The total plate count is intended to indicate the number of microorganism in any product .
- The total plate count is the enumeration of aerobic, mesophilic organisms that grow in aerobic condition under moderate temperatures of 20-45°C .
- This method is also known as standard plate count or total viable count.
- This method gives a quantitative estimate of the concentration of microorganism.

Requirements :-

- Plate count agar
- Weighing balance
- Petri plates
- Autoclave
- Pipettes
- Colony counter
- Incubator

Method :-



Calculation :-

* Calculation for Total plate count &

Yeast & Mould count :-

$$= \frac{\Sigma C}{(n_1 + 0.1n_2) d}$$

where, ΣC = Sum of counted colonies

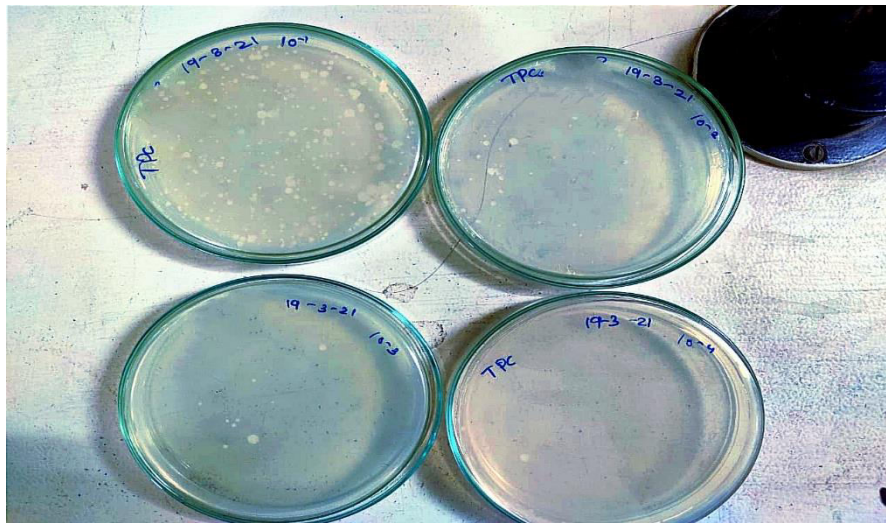
n_1 = Dishes (plates) counted in first dilution.

n_2 = Dishes counted in second dilution.

d = dilution factor for first dilution.

(2)

Result :-



(3)

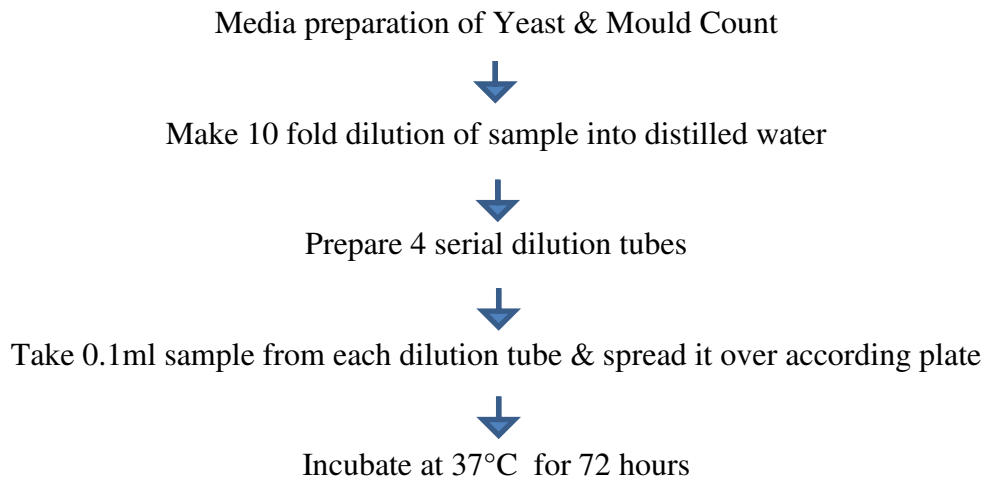
Yeast And Mould Count

- This method is used to identify number of Yeast & Mould present in the product.

Requirements :-

- CYGA (Chloramphenicol Yeast Glucose Agar)
- Weighing balance
- Petri plates
- Autoclave
- Pipettes
- Colony counter
- Incubator

Method :-



Calculation :-

* Calculation for Total plate count &

Yeast & Mould count :-

$$= \frac{\Sigma C}{(n_1 + 0.1n_2) d}$$

where, ΣC = Sum of counted colonies

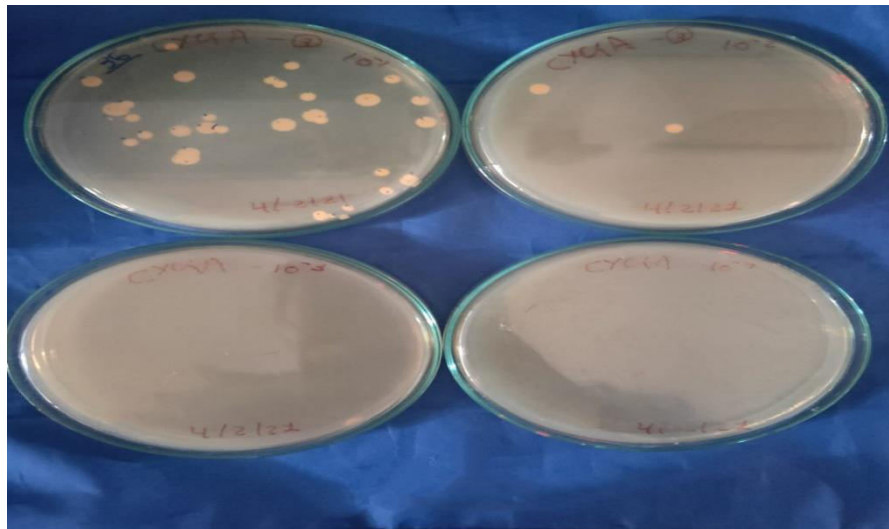
n_1 = Dishes (plates) counted in first dilution.

n_2 = Dishes counted in second dilution.

d = dilution factor for first dilution.

(4)

Result :-



(5)

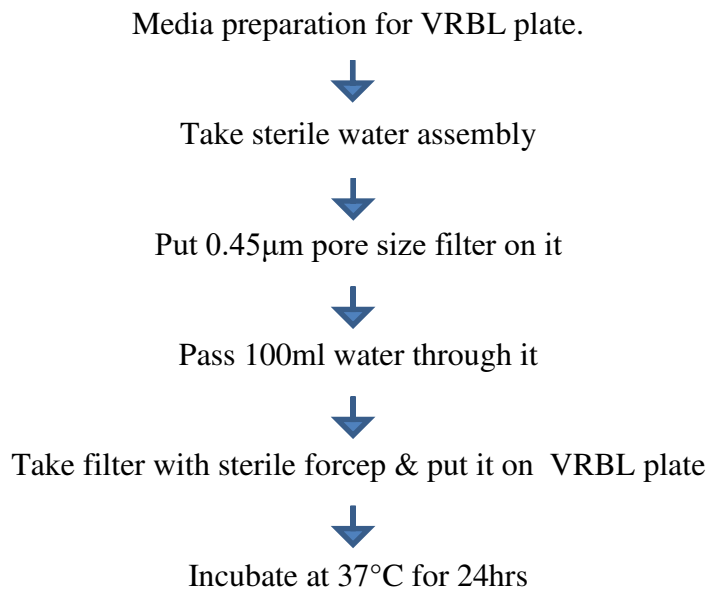
Membrane filtration method for detection of Coliforms

- This method is used to detect Coliforms from water sample.

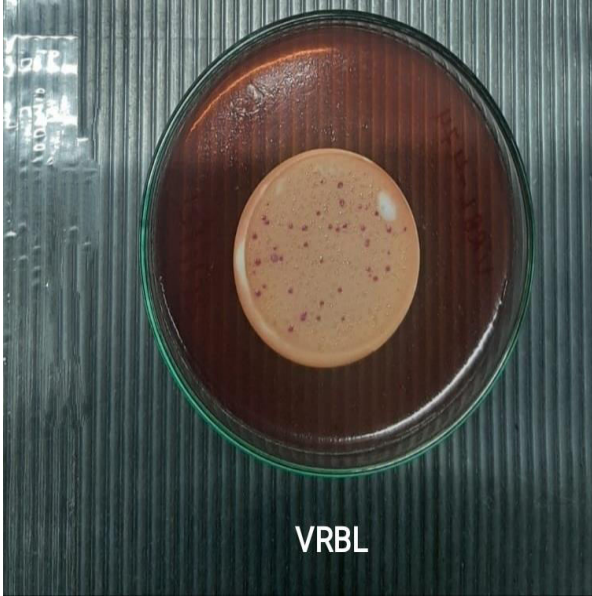
Requirements :-

- Membrane filtration Assembly
- Vacuum Pump
- 0.45µm pore sized filter paper
- Sterile Forceps
- VRBL (Violet Red Bile Lactose) Agar
- Water Sample

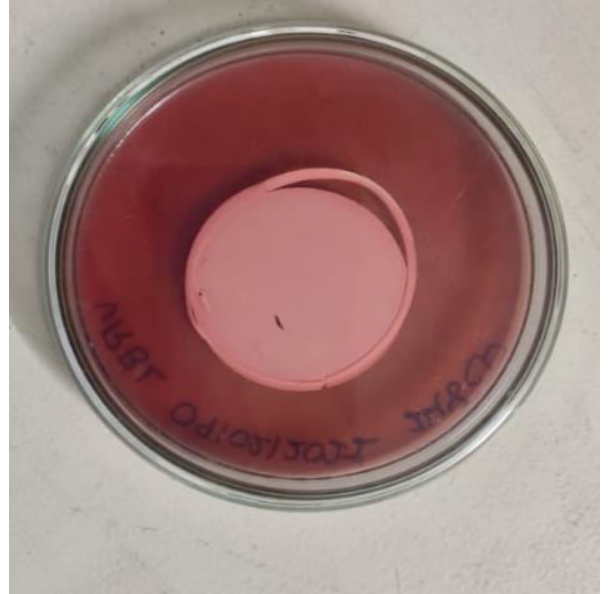
Method :-



Result :-



(6)
Positive



(7)
Negative

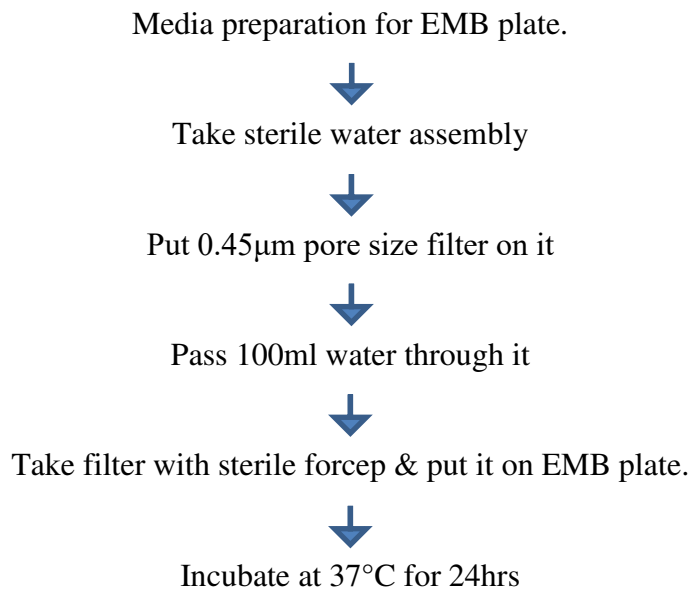
Membrane filtration method for detection of *E.coli*

- This method is used to detect *E.coli* from water sample.

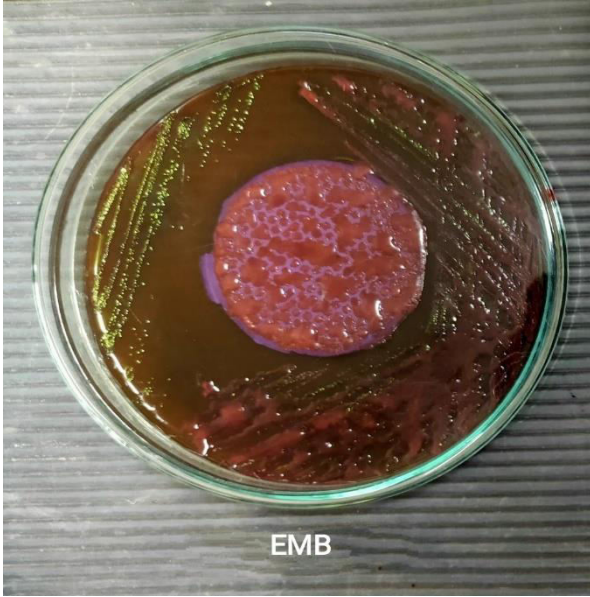
Requirements :-

- Membrane filtration Assembly
- Vacuum Pump
- 0.45µm pore sized filter paper
- Sterile Forceps
- EMB (Eosin Methylene Blue) Agar
- Water Sample

Method :-

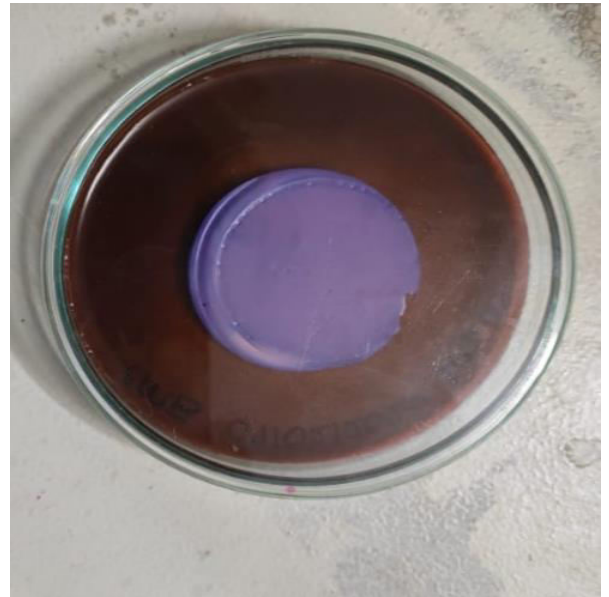


Result :-



(8)

Positive



(9)

Negative

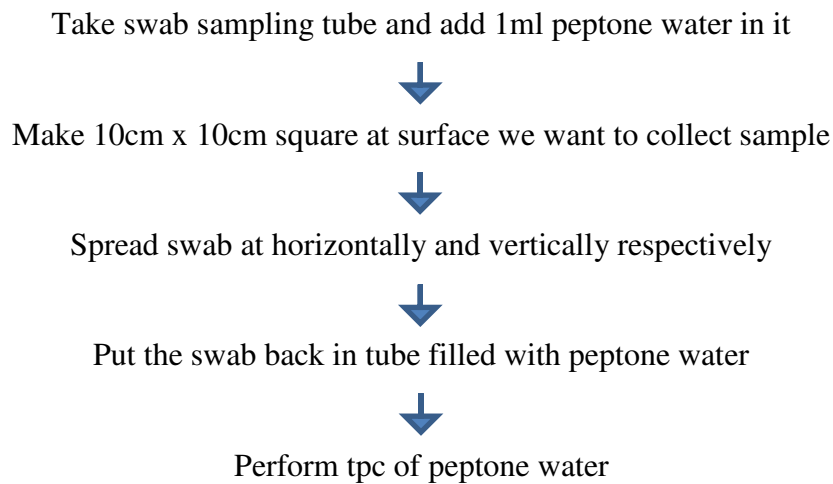
Swab Sampling

- This method is used to identify the number of microbes present on the surface area.

Requirements :-

- Swab
- Swab sampling tube
- Peptone water
- 10cm × 10cm square
- Requirements to perform TPC

Method :-



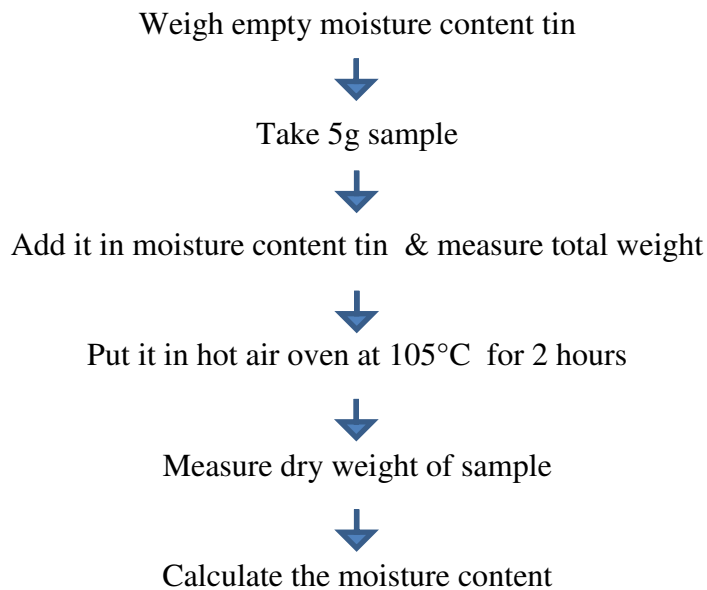
Moisture content measurement

- This method is used to measure the amount of moisture present in the sample.

Requirements :-

- Moisture content tins
- Weighing balance
- Hot air oven
- Sample

Method :-



Calculation :-

2. Calculation for Moisture content :-

$$= \frac{(B+s) - (D.W.)}{s} \times 100$$

where, B = weight of Blank dish

s = weight of sample

D.W. = Dry weight

(10)

Result :-



(11)

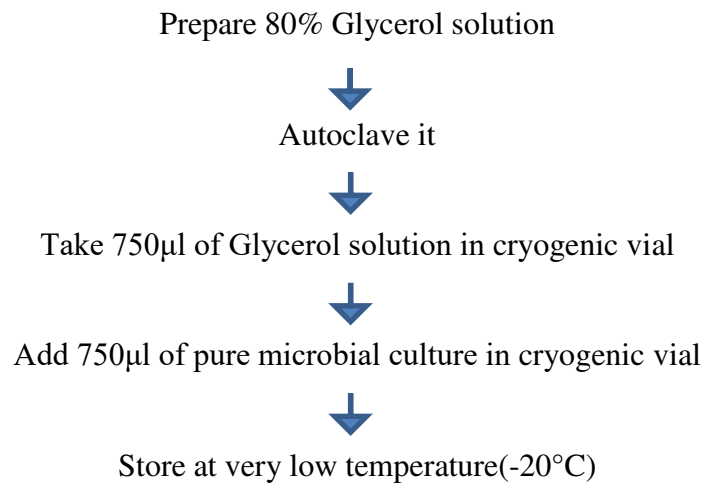
Preparation of Glycerol stock

- This method is used to preserve the pure culture of bacteria.

Requirements :-

- 80% Glycerol solution
- Cryogenic vial
- Pipette
- Sterile Tips
- Autoclave

Method :-



Conclusion

Various qualitative and quantitative tests were performed to check the quality of food products and water samples in this report 'Analysis of various food products and water samples'. After performing these tests we can conclude whether the quality of these are good or not , and we can consume it or not . My objective to analyse various products at physical , chemical µbial level was fulfilled by this work.

References

- IS 5402 (2012) : MICROBIOLOGY OF FOOD AND ANIMAL FEEDING STUFFS
- IS 5403 (1999) : METHOD FOR YEAST AND MOULD COUNT OF FOOD STUFFS AND ANIMAL FEEDS
- IS 1622 (1981) : METHODS OF SAMPLING AND MICROBIAL EXAMINATION OF WATER
- ISO 18593 (2018) : Microbiology of the food chain – Horizontal methods for surface sampling
- FSSAI Manual