

CHEMISTRY INVESTIGAORY PROJECT

PREPARATION OF SOYMILK



SUBMITTED TO –

SUBMITTED BY-

(P.G.T. CHEMISTRY)

INDEX

- ☐ Bona fide certificate
- ☐ Acknowledgement
- ☐ Aim
- ☐ Introduction
- ☐ Materials required
- ☐ Observation
- ☐ Result
- ☐ Glimpse from the experiment
- ☐ Bibliography

CERTIFICATE

This is to certify that the project report completed by _____

On the topic: “preparation of soya bean milk and its comparison with the natural milk to curd formation, effect of temperature and taste” in the department of chemistry ,J.N.V is according to the specification prescribed by C.B.S.E, New Delhi.

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ACKNOWLEDGEMENT

The successful completion any task would be incomplete without mentioning the names of those who helped to make it possible .I take this opportunity to express my gratitude in few words and respect to all those who helped me in the completion of this project .It is my humble pleasure to acknowledge my deep senses of gratitude to my chemistry teacher Mr. M.K BABELE, for his valuable support ,constant help and guidance at each and every stage, without which this project would not have come forth. I also register my sense of gratitude to our principal, Mr. B.R.KHEDKAR .

For his immense encouragement that has made this project successful. I would like to thanks my friends for encouraging me during the course of this project. Last but not least,I would like to thanks C.B.S.E for giving us the opportunity to undertake this project .

AIM OF THE EXPERIMENT

Preparation of soya bean milk and its comparison with the natural milk with respect to curd formation ,effect of temperature and taste.

INTRODUCTION

1.Soya milk contains about the same proportion of protein as cow`s milk around 3.5% also 2% fat,2.9% carbohydrate.

2.Natural milk is an opaque white fluid secreted by the mammary glands of female mammals and its main constituents are proteins, carbohydrate, minerals, vitamins, fats and water and are completely balanced diet.

3.Fresh cow/buffalo milk is sweetish in taste while soya milk is sour in taste.

4.However,when it is kept for a long time at a temperature of $(35\pm 5)^{\circ}\text{C}$, it becomes sour because of bacteria present in air.

5.Research has refuted claims that soya affects bone mineral density.

6.This bacteria converts lactose of milk start separating out as precipitate.

7.When the acidity in milk is sufficient and temperature id around 36°C , it forms semi-solid mass called curd.

8.Soya milk has same amount of protein as cow`s milk, though the amino acid profile differ.It contains little digestible calcium as it is bound to the bean`s pulp, which is indigestible by humans. So as to counter this, many manufacturer`s enrich their product with calcium carbonate available to human digestion.

9.Soya milk is by nature much lower in calcium compared to cow`s milk .Even calcium fortify soymilk loses to cow`s milk in term of the ease of absorption. The lactose in cow`s milk catalyses calcium uptake in the intestine, so that more calcium can be absorbed.

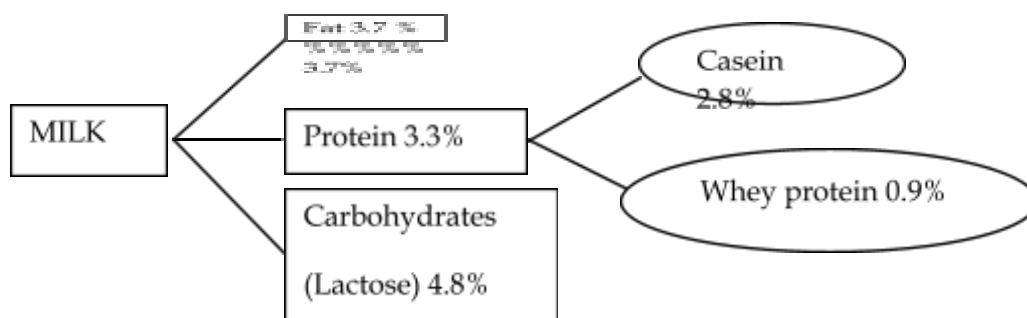
10. Another set back regarding soya milk nutrition is the potential to allergies. Just like the milk protein casein ,soya proteins can also lead to anaphylactic reactions , and these occurrences are more prevalent and more severe in children than in adults. Children who are sensitive to soya can exhibit allergic symptoms such as hives ,swelling and diarrhea if they drink soya milk .In more serious cases , they can have breathing difficulties and other life threatening syndromes.

DRINK SOYA MILK TO PROTECT YOUR HEART!!!

1. Elderly and heart patients are most suited to use soya milk as a dairy alternative. Whole milk contains a significant amount of saturated fat and cholesterol which increase the risk of plaque formation and heart disease Skim milk thus not have this problem but it is watery and much less appetizing. Soya milk is naturally cholesterol free with an extra doss of heart healthy monounsaturated and poly unsaturated fatty acids that effectively reduce your blood cholesterol level. The phytosterols in soya milk can further improve your heart conditions by controlling your blood pressure and preventing cholesterol absorption in your intestines. Studies have shown that drinking soya milk can lower your risk for atherosclerosis and strokes making them an effective in prevention and treatment of heart disease.

SWITCH TO SOYA MILK FOR WEIGHT CONTROL!!!!

1.Each cup of plain soya milk contains about 7 grams of sugar and 80 calories. Soya milk also contains fibre which is not present on dairy milk. The extra fibre makes soya milk more filling for natural suppression of your appetite . Additionally, the monounsaturated fatty acids can inhibit fat absorption during digestion and reduce the chance of fat storage.



MATERIALS REQUIRED

- ☐ Beakers
- ☐ Pestle and mortar
- ☐ Measuring cylinders
- ☐ Glass – rod
- ☐ Tripod stand-stand
- ☐ Thermometer
- ☐ Muslin clothes
- ☐ Burner
- ☐ Soya beans
- ☐ Buffalo milk
- ☐ Fresh curd
- ☐ Distilled water.

PROCEDURE

A) PREPARING SOYA MILK

1. Soak about 100 g of soya beans in sufficient amount of water for 24 hours .
2. Take out swollen soya beans and grind them to a very fine paste with a pestle-mortar.
3. Add about 250 ml of water to this paste filter it through a muslin cloth.
4. Clear white filtrate is soya bean milk. Compare its taste with buffalo mil .

B) CURD PREPARATION AT DIFFERENT TEMPERATURES

5. Take 50ml of buffalo milk in three beakers and heat the beaker to 300,400 and 500 °C respectively.
6. Add spoonful curd to each of the beakers and leave the beakers undisturbed for 8 hours till curd is ready.
7. Similar, take 50 ml of soya bean milk three other beakers and heat the beakers at 300,400 and 500°C respectively .
8. Add a spoonful of curd to each of these three beakers.
9. Leave the beakers undisturbed for 8 hours and wait till curd is formed .

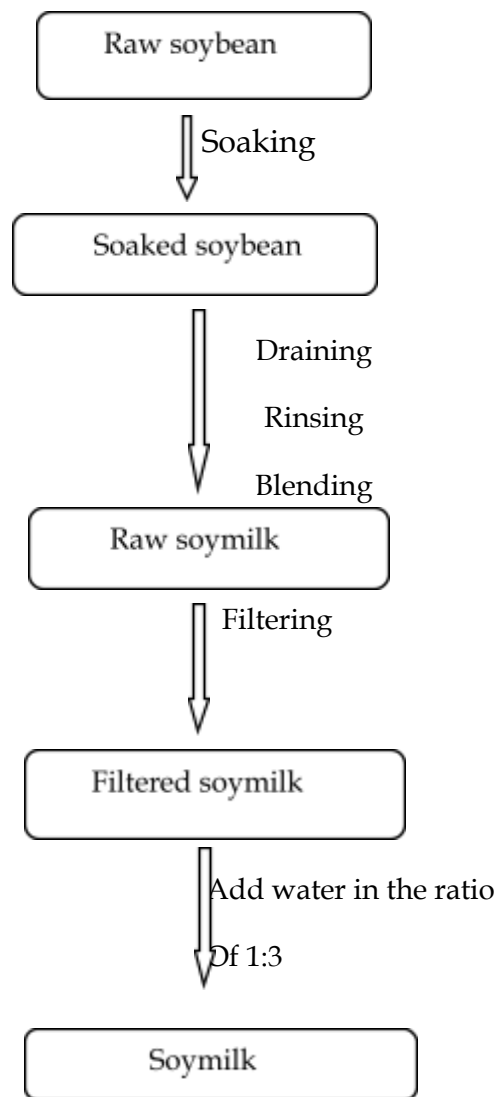


Figure 1 : Flow chart for the Preparation of soymilk.

OBSERVATION

Types Of Milk	Beaker no.	Temperature	Quality of curd	Taste of curd
Buffalo Milk	1	30°	Perfectly dense ,semi dense	Sour
	2	40°	Liquid type	Less sour
	3	50°	Highly liquid	tasteless
Soya bean milk	1	30°	Almost semi solid	Sour but less than buffalo milk
	2	40°	Little watery	Sour
	3	50°	High water	Tasteless

RESULT

❖ For buffalo milk , the best temperature for the formation of good quality and tasty curd is 30°C and for soya milk , it is 40°C .

1. Natural milk is sweet in taste while soya milk is sour .
2. The curd formation takes at faster rate with increase in temperature in both type of milk .
3. In natural milk, fermentation takes place at a higher temperature leading to formation of larger amount of lactic acid which imparts sour taste.
4. If the soya milk is kept outside for more than 12 hours in a metal container it gets spoiled.

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