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A STUDY ON QUALITY OF CURD PRODUCED FROM DIFFERENT TYPES OF MILK

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ABSTRACT

The evolution of human life made his life more modernized. The man ate raw food in the early times. The evolution changed his way of in-taking the food. He started agriculture to have his food and he yielded various types of crops like rice, wheat, maize etc. he used cattle for primary steps of agriculture and cultivation. The cattle which they used for agriculture gave milk later on they considered it has a food which is safe to have and started having milk with the other food materials. At this stage milk came into the food list of human being. The modernization of human being been developed day by day and this factor is responsible for his evolution in food. Curds are a dairy product obtained by coagulating milk in a process called curdling. In this study, different types of cow milk were used for the preparation of curd and its qualities such as taste, texture, protein content and shelf life were analyzed.

KEYWORDS: Milk, curd, fermentation, Taste, texture, protein and shelf life.

INTRODUCTION

Milk and dairy products continue to play an important role in the nutrition of people in many parts of the world. Milk has been shown to be ideal for the growth of microorganisms due to its water, protein, carbohydrate, mineral and vitamin contents, all of which are important to many bacteria.[1] Storage of milk for long periods under refrigeration temperatures has resulted in new quality problems for the dairy industry arising out of the growth and metabolic activities of wild microorganisms at low temperatures. To overcome the

economical losses fermented milk products came into use. Fermented milks with different names, traditional produced in different countries were reported in prehistoric period and were probably known around the year 2000 BC.[2]

Curd is a fermented dairy product of major importance in Indian subcontinent. From the time immemorial it is being used for its nutritive and therapeutic values.[3] In Ayurveda, use of curd is recommended for curing of ailments like dysentery, dyspepsia and other gastrointestinal disorder. It also improves appetite by stimulating B and T cells of macrophages by lactic acid bacteria.[4] Readily available form of all the nutrients is also present in curd. It alleviates bone problems and a good form of predigested food.[5] Bureau of Indian Standards (1980) defines curd as a product obtained by lactic fermentation of cow or buffalo or mixed milk caused by single or mixed strains of lactic acid bacteria or by alcoholic fermentative yeasts. The preparation of curd includes pasteurization of raw milk, standardization followed by inoculating the standardized milk with starter cultures and incubation at about 37-42^{o}C depending on the types of cultures used.[6] Traditionally, it is produced by boiling cow, buffalo or mixed milk fermented naturally or with previous day's curd.[7] Because of the natural souring process, wide variations are seen in the quality of market curd.[8] The starter cultures used in curd are not definite and the quality of curd varies according to the culture used. There are reports of wide variations in the physico-chemical, microbial and sensory qualities of yoghurt and yoghurt like products in many countries.[8, 9, 10]

Buttermilk and curd were mentioned in Indian Vedas and were known since 800-300 BC.[11] Curd is an important fermented product used in India as a refreshing beverage. It has mild pleasant flavour, with a clean acidic taste, a creamy white colour with a smooth, gloosy surface and cream layer on top. The mass of curd is expected to be soft and firm, free from gas holes.[12] It is well known that curd cannot be kept for more than 24 hours (16 0 ... 24 0C). On prolonged storage it becomes highly acidic, thus making it unpalatable for human consumption. Therefore different methods are applied to restrict the growth of spoilage undesirable microorganisms. Research work at National Dairy Research Institute, Bangalore has shown that bottled curd of long keeping quality can be prepared by using selective strains of lactic acid bacteria (LAB).[13] LAB shows remarkable antimicrobial activity against pathogens and spoilage microorganisms. This is mainly attributed to the production of some compounds with antimicrobial activity as lactic and other organic acids, hydrogen peroxide bacteriocins and other low molecular mass compounds with biopreservative capacity. It has

become necessary to identify such cultures, can increase the shelf life of curd traditional produced and preserved under ambient conditions without compromising with the standard quality.

MATERIALS AND METHODS

COLLECTION AND PRESERVATION OF MILK SAMPLES

Different packets of milk samples, such as (S_1, S_2, S_3, S_4, S_5, S_6) were collected from commercial market and were stored at $4^{O}C$.

PREPARATION OF CURD

- 150 ml of sample in each variant is measured and taken in a separate conical flask for the preparation of curd at the room temperature.
- Each milk sample was inoculated with required volume of different inoculum such as lemon, vinegar and yeast to prepare curd.

ANALYSIS OF PROPERTIES OF CURD

Various properties of curd such as taste, texture, water content and protein[14] contents were analyzed as per the standard procedure.

RESULTS AND DISCUSSION

Chemical state of milk proteins and products of their breakdown impart characteristic physical, chemical and sensory properties to most of the dairy products.[15] The flavour of milk product is therefore a combination of aroma, taste and mouth feel.[16] Flavour development occurs due to the release of small peptides and amino acids by proteolysis activity or due to lipolysis.[17]

In this work various milk samples were utilized and lemon juice, yeast and vinegar were used as inoculum to prepare the pure curd and it was observed after 24 hours from the time of inoculation. The shelf life of curd was also observed by checking the decomposition time from the time of curd formed (Fig 1-10).

Fig 1: Different types of milk sample.

Fig 2: S1L.

Fig 3: S1Y.

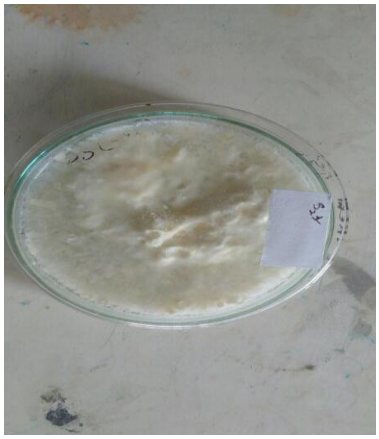

Fig 4: S2Y.

Fig 5: S2L.

Fig 6: S3Y.

Fig 7: S4L.

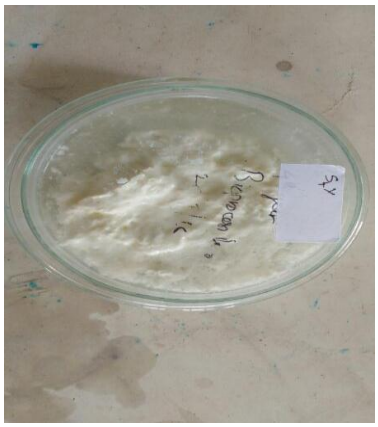

Fig 8: S4Y.

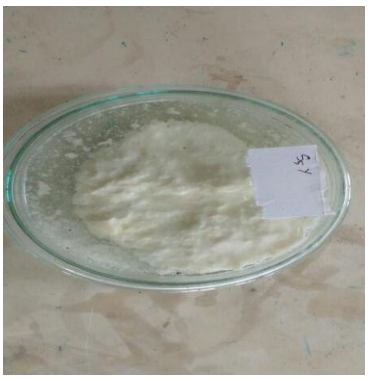

Fig.9 S5Y

Fig.10 S6Y

In this work, S1 milk was having more water content among all varieties. S1V and S4V had good shelf life time.

Table 1: Properties of curd prepared from S1 Milk sample.

S.No	Inoculum	Taste of curd	Texture of curd	Water content	Protein content	Shelf life time (approx)
S_1L	Lemon	Slight bitter	Creamy	38ml	0.40	48 hours
S_1Y	Yeast	sweet	Mild creamy	60ml	0.40	40 hours
S_1V	Vinegar	Sour	Creamy	12ml	0.40	56 hours

Table 2: Properties of curd prepared from S2 milk sample.

S.No	Inoculum	Taste of curd	Texture of curd	Water content	Protein content	Shelf life time (approx)
S_2L	Lemon	Slight sour and bitter	Pale creamy	17ml	0.31	44 hours
S_2Y	Yeast	sour	Low creamy	7ml	0.31	42 hours
S_2V	Vinegar	bitter	High creamy	3ml	0.31	48 hours

Table 3: Properties of curd prepared from S3 milk sample.

S.No	Inoculum	Taste of curd	Texture of curd	Water content	Protein content	Shelf life time
S_3L	Lemon	Slight sweet	White watery	31ml	0.46	48 hours
S_3Y	Yeast	Sweet	Low creamy	37ml	0.46	50 hours
S_3V	Vinegar	Sour	Mild creamy	20ml	0.46	44 hours

Table 4: Properties of curd prepared from S4 milk sample.

S.No	Inoculum	Taste of curd	Texture of curd	Water content	Protein content (mg/ml)	Shelf life time
S_4L	Lemon	Sour and sweet	Mild yellowish Creamy	15ml	0.17	48 hours
S_4Y	Yeast	sour	Creamy	18ml	0.17	56 hours
S_4V	Vinegar	Slight sour	Low watery	15ml	0.17	50 hours

Table 5: Properties of curd prepared from S5 milk sample.

S.No	Inoculum	Taste of curd	Texture of curd	Water content	Protein content	Shelf life time (approx)
S_5L	Lemon	Sour and sweet	Creamy	18ml	0.28	38 hours
S_5Y	Yeast	sweet	Mild creamy	16ml	0.28	44 hours
S_5V	Vinegar	sweet	Creamy	17ml	0.28	48 hours

Table 6: Properties of curd prepared from S6 milk sample.

S.No	Inoculum	Taste of curd	Texture of curd	Water content	Protein content	Shelf life time
S_6L	Lemon	sweet	Yellowish creamy	18ml	0.21	48 hours
S_6Y	Yeast	sweet	High watery	20ml	0.21	44 hours
S_6V	Vinegar	mild sour	Creamy	11ml	0.21	50 hours

Among all types, S3 milk showed high protein content (0.46 mg/ml) and low protein content was found in S4 milk (0.17mg/ml). S2L and S2V showed bitter taste after fermentation. The shelf life period of curd was found to be maximum in S1 milk inoculated with vinegar and S4 milk (56 hrs) inoculated with yeast and low was found in S5 milk inoculated with lemon (38 hrs). It was also found that the water content of the curd was also varied for the same milk sample after it turned to curd.

CONCLUSION

Curd is a popular fermented milk product of Eastern and North-Eastern part of India has lot of variations in the preparation methods. In this study, different milk products were analyzed for its curd formation with different inoculum. In future study, quality of curd could have been enhanced by different techniques may be carried out.

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