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### Research Article

## A Nutritional Analysis of Raw Milk Samples of in and around Thiruvannamalai, Tamilnadu.

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#### Keywords

Acidity, Fat,  
Protein, Corrected  
Lactometer Reading  
(CLR) and  
Solids-  
Not-Fat (SNF).

#### Abstract

The aim of this study was to evaluate fresh, whole powdered and infant raw milk on the basis of physicochemical characteristics. All samples were collected from local market then analyzed to know the chemical (acidity, fat, protein, Corrected Lactometer Reading (CLR) and solids-not-fat (SNF)) characteristics. Protein and fat content for all samples ranged 3.34–25.5% and 3.73–26.3%, respectively. The composition and physico-chemical properties of raw milk samples on titratable acidity, density and solids-not-fat (SNF) have been presented.

### 1. Introduction

Milk is considered as a nearly complete food since it is a good source for protein, fat and major minerals. Also milk and milk product are main constituents of the daily diet. Especially for vulnerable groups such as infants' school age children and old age (Davies et al., 1986). Several studies have reported the distribution and occurrence of the essential components in various animals' milks (Kholif et al., 1994).

A multitude of factors influence the final composition of milk including genetics and breed of animal, environment, stage of lactation, parity, and nutrition of the cow. Although all of these factors work in combination to determine the final composition of milk, the focus of this paper is on nutrition of the cow and how it influences milk fat, protein, and lactose. In the case of nutritional control, a change in milk composition is realized when one or more desired nutrients are incorporated into the diet of the cow, followed by absorption and transport of the nutrient to the mammary gland, and terminate with secretion of the nutrient in milk as either a desired component or as a regulator of milk synthesis.

Whole milk is over 96% fat-free, but on a dry basis, fat content is high (27%) with the majority (65%) of the fatty acids being saturated. About 50% of the calories in milk come from fat. In 1994, dairy products accounted for 9.3% of the

total food energy consumed, 12.3% of the fat consumed, and 23.6% of the saturated fat consumed in the **United States Economic Research Service/USDA (2011)**. Milk and milk products in the United Kingdom in 1992 accounted for 15% of the total fat consumed and 23% of the saturated fat consumed.

### 2. Materials and Methods

#### 2.1 Collection of samples:

The samples were collected from private dairy plant. 100 ml of screw bottle was taken to collect the samples kept stored in cool condition until transported to the microbiological laboratory. After the sample were analyzed within 24 hours.

#### 2.2 Protein analysis

10ml of milk sample was taken in a small beaker added to 0.4ml of potassium oxalate saturated. Then add 5 drops of phenolphthalein indicator mix well add 2ml of formaldehyde solution titrate against (0.1N) sodium hydroxide solution.

= Normal value 2.1 x BR

**2.3 Analysis of fat:****Prepared of reagents:**

- Gerber's acid: 90-91% sulphuric acid having a specific gravity of 1.82-1.825 g/ml
- Amyl alcohol: with a specific gravity of 0.814-0.816 at 60°F

Take 10ml of Gerber's acid in butyrometer add 10.75ml of milk. Measure 1ml of amyl alcohol wiper the neck of the butyrometer with cotton close the neck. Mix the contents of the butyrometer thoroughly until the curd is dissolved and no white particles are seen in the liquid by holding both ends of the butyrometer. Transfer the butyrometer with the dumb up into a water bath at 60°C and leave it there for about 5minutes for tempering. Dry the butyrometer and place it in the Gerber's centrifuge for centrifugation of 1100 rpm for 4-5 minutes.

**2.4 Estimation of acidity in milk:****Prepared of reagents:**

- 0.1N NaOH
- Phenolphthalein indicator

10ml of milk was taken in clean dry perlain dish. Add 0.1N NaOH in burette add 2 drops of phenolphthalein indicator and titrate with 0.1N NaOH.

$$\begin{aligned} &= \frac{9 \times 0.1 \times \text{BR}}{10} \\ &= 0.09 \text{g lactic acid} \times \text{BR} \end{aligned}$$

**3. Results****Physicochemical analysis of raw milk:**

The result of fat, protein, solid not fat titratable acidity and correct lactometer result level were given in table 1 as the studied 15 areas raw milk sample from private milk and dairy products. To analysis of variance showed low significant variation from the source of compared favourably with the composition of 15 areas raw milk in Thiruvannamalai (D.t).

There was a significant different in fat, protein, solid not fat and acidity among the studied 15 areas raw milk samples. There was a light different in the percentage of fat, protein, solid not fat and acidity of raw milk samples. The composition of this present study favourably compared with computation of total of raw milk in private milk dairy.

PHYSIO -CHEMICAL ANALYSIS OF MILK					
NO.OF SAMPLE	CLR*	SNF*	FAT*	PROTEIN*	ACIDITY*
THANIPADI	26.5	7.80	4.10	3.15	0.135
VAANAPURAM	23.5	6.80	3.00	3.25	0.125
PUDUPALAIYAM	28.0	7.90	4.00	3.10	0.135
MEL VANAKAPADI	24.0	7.00	3.80	3.00	0.108
THACHAMPATTU	27.0	8.00	4.20	3.12	0.117
THIRUVANNAMALAI	25.0	7.30	3.60	2.90	0.126
NAYAMPADI	28.0	8.10	3.80	3.10	0.126
KUPPANATHAM	28.5	8.20	3.60	3.00	0.117
THOSAPADI	24.5	7.20	4.50	3.20	0.135
KARIYAMANGALAM	27.0	8.50	4.20	3.20	0.108
SATHANUR	28.5	8.30	3.90	3.00	0.117
THANDARAMPATTU	27.0	7.90	3.50	3.05	0.135
MEL CHENGAM	24.5	7.20	4.50	3.10	0.126
KUPPANTHANGAL	28.0	8.30	4.10	2.90	0.135
CHENGAM	27.0	7.80	3.60	3.10	0.126

\*Percentage

In this pilot study was produce basic variation between among the 15 place of samples were analysed CLR, SNF, Fat, Protein and Acidity also mentioned the above table.

The kuppnanatham village produce high CLR (28.5%) rate in all the 15 samples and low rate present in Vannapuram. The SNF is an important content of milk Kariyamangalam report

high SNF (8.5%) rate and low SNF (6.8%) shows on vaanapuram. The Fat was important one for milk producers its mainly depends on rate variation between other milk samples of Melchengam and thosapadi obtained high fat and also vaanapuram recorded on low fat. The milk Protein is an important one the vaanapuram obtained high protine

and lower noticed on kuppangthangal. Acidity is played on important role in raw milk production Kariyamangalam noticed on high acidity and compare to all other sample villages. This study was carried out for ISO standard for milk and milk products.

#### 4. Discussion

In this study noticed and discussed about the milk containing fat, protein, solid not fat titratable acidity and correct lactometer result level were given in table as the studied on **ISO 707: 1985**, Milk and milk products - Methods of sampling was followed to collect 15 raw milk sample from selected areas of private milk and dairy products. The normal physiochemical qualities of raw milk fat 3.25 % protein 3.22% solid not fat 8.5 % and acidity 0.135%. The analysis of variance showed low significant variation from the source of compared favourably with the composition of 15 areas raw milk in Thiruvannamalai (D.t).

The among the milk sample were analysed and compared to ISO Standard for milk and milk products (**ISO 3951: 1981**) were compared to in this study, kuppangtham village produce high CLR (28.5%) rate in all the 15 samples and low rate present in Vannapuram. The SNF is an important content of milk Kariyamangalam report high SNF (8.5%) rate and low SNF (6.8%) shows on vaanapuram. The Fat was important one for milk producers its mainly depends on rate variation between other milk samples of Melchengam and thosapadi obtained high fat and also vaanapuram recorded on low fat. The milk Protein is an important one the vaanapuram obtained high protine and lower noticed on kuppangthangal. Acidity is played on important role in raw milk production Kariyamangalam noticed on high acidity and compare to all other sample villages. This study was carried out for ISO standard for milk and milk products (**ISO 3951: 1981**) Sampling procedures and charts for inspection by variables for percent defective of the milk samples.

#### 5. Conclusion

Milk is a rich source of all essential nutri components to provide the nutritional requirements to human and animals. However, in this study noticed some raw milk contain comparatively higher concentrations of nutrient like Fat, SNF, CLR and Protein. The some samples contain high acidity. It suggests that the modern technology and quality control for milk processing should be improved quality of milk and made ECO friendly nature.

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