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# PHYSICOCHEMICAL PARAMETER APPLY FOR QUALITATIVE INVESTIGATION OF MILK

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**ABSTRACT**

In this research investigation are analysis to milk quality between in buffalo, cow, dairy, goat and sheep. Quality was improved through applied techniques isolation of casein, methylene blue reduction and determination of TDT and TDP for pasteurization of milk samples.

## INTRODUCTION

Milk is virtually sterile when it is synthesized in a healthy mammalians udder. Milk have completely nutritional substrate [1, 2], it may become contaminated with bacteria during extraction from mammary gland of mammalians the infected milk due to borne pathogens of disease. Bacterialpathogens become in milk at the time of milk extraction through animals the outside of the udder or milk equipment's [3, 4]. In this case nutritional component responsible for optimal growth of bacteria is different milk containing and also temperature plays an important role to grow pathogenic micro-organisms at body temperature 35±2˚C [5, 6]. Human illness from milk borne pathogens is usually associated with consumption of raw milk. Mostly *E coli* have been isolated from bulk tank samples become there is a risk of pathogen contamination [7, 8, 9]. In conditions pasteurization of milk to consumption will destroy pathogens as well as provide protection from illness, microbes occasionally, human illness has been linked to unpasteurized milk product but these cases usually have been a result of can natural of the product after pasteurization [10].

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## MATERIALS AND METHODOLOGY

### Collection of Milk Samples

Each, 100ml of milk samples was collected in well cleaned and sterilized glassware from mammalians source such as buffalo, cow, dairy, goat and sheep from local area of Betul district.

### Isolation of Milk Casein

Casein determination to apply following procedure such as 100ml milk sample was taken from each source in 500ml beakers and given primary heat it in water bath and centrifuge at 10000 rpm for 5min. to remove fat layer and add 100ml distilled water in each samples to skimmed, after that samples again kept in water bath at 40ºC for 60min. after that samples was remove outside from water bath and its kept at RT for 30min. and slowly added 0.4M HCL by using a dropper while mixture gained the pH 4.6. Now further samples were flirter with cheese

cloth and collect the precipitated to know the wet weight. To know the dry weight samples was placed in hot air oven at 100ºC until dry.

**Quality Analysis of milk**

To quality improved of milk sample, 1ml of methylene blue solution taken in test tubes was added 10ml milk sample in each tube and gently shakes to each sample and inculcated it at 40ºC. in a water bath, the tube was observed after several times interval, until the blue colors disappears the time required for the reduction of methylene blue.

**Determination of TDT and TDP of milk**

To pasteurization of milk samples in which contained microorganisms through various ways where described two procedures known as thermal death times (TDT) and thermal death points (TDP). determine the TDT first setup 80°C temperature maintained a water bath and prepared replicates of each five sources where taken 1ml milk samples in each test tube to exposed for 10min, 20min, 30min, 40min, 50min and 60min separately. to determine the TDP first prepared replicates of each five sources where taken 1ml milk samples in each test tube and given heat treatment at different temperature such as 40ºC, 50ºC, 60ºC, 70ºC, 80ºC, 90ºC and 100ºC. to exposed for constant time at 30min. of each separately. Removed outside tube from water bath and quickly cool under running top water. After that pour it with NAM in sterilized petri plates and incubated to all plates in incubator for 24 hours.

**Fig 1. Quantity of casein protein in milk samples**

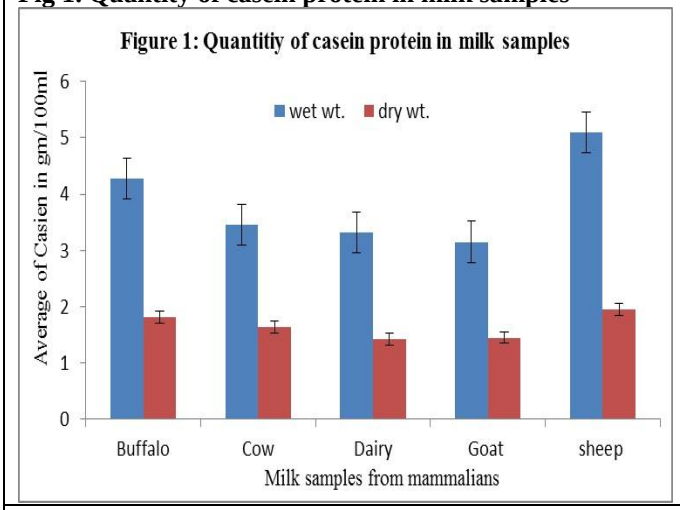



**Fig 2. Quality of milk samples**

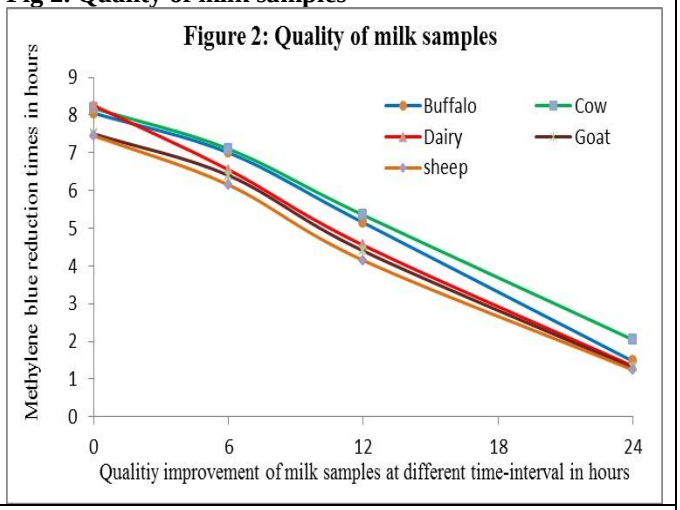



**Fig 3. TDT counting of milk samples contained micro-organisms at constant temperature 80°c**

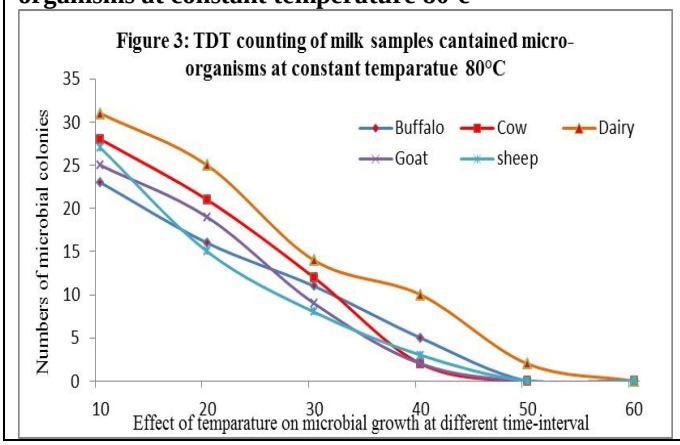
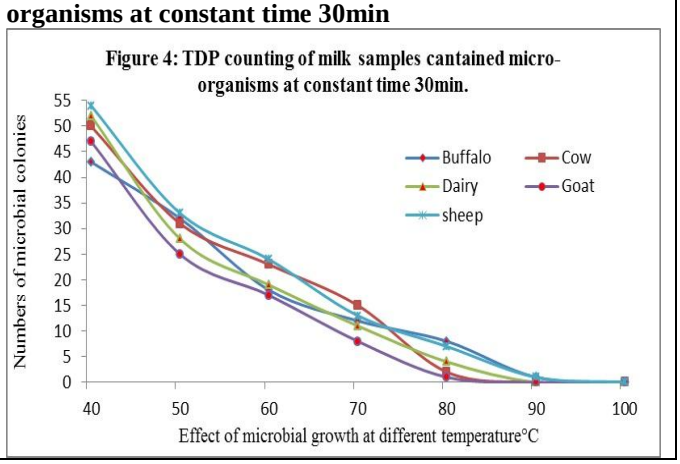



**Fig 4. TDP counting of milk samples contained micro-organisms at constant time 30min**




**RESULTS AND DISCUSSION**

Milk Casein are as protein sources in milk it consist several amino acids its necessary for all living organism present inside and outside the cells of they do their function occurring as enzymes, hormonal etc. in this research we have extracted proteins at optimum pH 4.6 of casein, from sources mammalians in which most wet weight amounts gained in 5.10gm of sheep milk and lowest 3.15gm in goat milk while dry weight of 1.95gm in sheep and lowest 1.42gm in dairy milk from 100ml milk samples, comparative results showing in figure 1.

The methylene blue reduction test depends on the theory that the dye is colored when oxidized but becomes colorless when reduced in performing tube and the initial microbial content of the sample more than 8hours excellent, 6-8 hours good, 2-6hours fair and less than 2 hours poor. Where we have given highest and lowest values from gained resulted at several time intervals at fresh milk samples at 0hour. Taken decolorized time of 8.25 hours of dairy milk and 7.45hours of sheep and after 6hours decolorized time of 7.10hours of cow and 6.15hours of sheep and after 12hours 5.35hours of cow and 4.15 hours sheep and after 24hours 2.05 hours of cow and 1.25hours of sheep milk samples was taken time to reduction of methylene blue dye from milk at 40ºC. Detail results showed in figure 2.

Time and temperature play very important role to pasteurization of milk it done to free from micro-organisms it procedure also known as thermal death times and thermal death points to kill the cell. it is necessary to compare the susceptibility of different micro-organisms to rising temperature however some factors such as pH, moisture, composition of media & age of cells, activities at than optimum temperature and time period increase or decrease to microbial survival leading to death.in this research we was found that TDT at constant temperature 80ºC to expose 50min of milk may be free from micro-organisms. While TDP was at constant time 30min to expose 90ºC temperatures to free from microorganisms. Details showed in figures 3 &4.

## CONCLUSIONS

Milk products are very essential for living organisms it is complete nutrition supplements contain. That way many micro-organisms such as *E. coli, lactobacillus sp.* etc. easily grows in this that is responsible to change nature of milk. Determination is milk quality through various such as chemical based methylene blue reduction, pH, density, viscosity, surface tension physic chemical parameters applying to know quality of milk. And another parameter do to free from micro-organisms of milk such as TDT and TDP know as pasteurization of milk, *E. coli, S. aureus,* and *L. monocytogenes* occur frequently in milk products, such as curd and cottage cheese [4,9, 11]. Milk is one of the most important nutrients casein, a major milk protein.

## ACKNOWLEDGEMENT

Nil

## CONFLICT OF INTEREST

No interest

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