

# Which Milk is Best for Health, Raw Milk or Boiled Milk



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## Abstract

We know that milk is a complete food, but our body is not able to absorb all nutrients from milk due to several times boiling of milk at home. Boiling of milk several times at home destroys its all enzymes and vitamins' biological activities. Due to lack of vitamins, vitamin-D and vitamin -D3, our body would not be able to absorb calcium from milk. We buy so costly milk but due to our extra activities, our body is not able to absorb vitamins and calcium from milk. It is a well-known fact that all vitamins as A, B, C, D, D3 would be destroyed by several time boiling of milk at home. On the other hand if we drink/use milk in the raw form, it is also not safe. It is even dangerous in long time use because several types of pathogens come in the milk from diseased cow, buffalo, goat. Several diseases like T.B, stomach pain, intestine infections are mostly developed from raw milk.

Mostly milk is boiled more than three times and hence becomes devoid of very essential vitamins. Milk is a very vital source of vitamins D, D3, B12, which are very essential in absorbing calcium. Vitamins D, D3, B12 are very heat sensitive. Lack of vitamins causes growth deficiency in children and bones become weak.

Due to repeated boiling of milk, proteins get denatured in such a way that they get destroyed if milk is boiled above 100°C for 20 minutes. Thus children have less muscle and bone development. In long term neurological problems arise in children.

**Keywords:** Nutrients, Vitamins, Pathogens, Raw Milk, Boiled Milk, Calcium, Pasteurization, Intestinal Infections, Tuberculosis (T B).

## Introduction

Milk is pasteurized in dairy to kill pathogens and microorganisms without badly affecting its nutritional values. But in houses milk is heated several times above 100°C that becomes a cause of change in milk constituents. If the temperature is more for a long time exposure, the milk becomes devoid of vitamins and proteins. Since solubility of calcium phosphate decreases with increase of temperature thus heating of milk causes precipitation of calcium phosphate in the form of micelles and reaction becomes irreversible on cooling. During boiling of milk at high temperature the milk becomes acidic and thus pH drops. Since vitamin-C is heat sensitive, it loses during boiling. Loss of vitamin-C affects vitamin B12 badly and folic acid oxidation increases. It will decrease absorption of iron from milk and food. Since repeated boiling of milk makes it deplete of vitamins D, D3, A, B, C, B12 and folic acid. Thus our body cannot take nutrition from milk. Thus weak bones and poor muscles are the result in children. On the other hand if we take the milk as raw, it is also not safe. Raw milk can cause T B, intestinal infections and stomach pain etc.

## Review of Literature

We all know that milk is one of the richest sources of calcium, proteins, vitamins and iron. Good level of calcium in the body saves from bone-related ailments like osteoporosis, bone injuries and others. Calcium, vitamin D, C, B12 and iron are some of the most important nutrients for women. Raw milk doesn't enjoy good favors from many around the world. Raw milk is a source of vitamin C which is lost after it is pasteurized or cooked. According to the Centers for Disease Control and Prevention, United States (CDC), "Raw milk and products made from it (including soft cheese, ice cream, and yogurt) can pose severe health risks.

That's because raw milk has not undergone a process called pasteurization that kills disease-causing germs, such as Campylobacter, E. coli, and Salmonella."

According to Dr Sunil Sharma, general physician and head of emergency, Madan Mohan Malviya Hospital New Delhi. Raw milk should never be consumed. It may lead to infections and serious health issues.

Pasteurization is a process which is undertaken by dairy companies. Milk is heated for at least thirty minutes at 145<sup>o</sup> F. High Temperature Short Term Pasteurization which involves heating milk for 15 seconds at 161.1<sup>o</sup> F. Ultra Heat Treat, in which milk is heated to 280<sup>o</sup> F for 2 seconds.

Raw milk is more nutritious. Vitamins and proteins are denatured and destroyed when milk is boiled at temperatures above 100 degrees Celsius (212F) for over 15 minutes.

Pasteurization takes place at a lower temperature and does not affect nutrient content in a meaningful way. The U.S. Food and Drug Administration state that there are no significant differences in nutritional value between pasteurized and unpasteurized milk.

The pasteurization process is designed to protect people from dangerous organisms that can cause diseases such as typhoid fever, tuberculosis or diphtheria.

#### **Aim of the Study**

Aim of study is that reader must know the necessity to heat the milk at low temperature at about 80<sup>o</sup>C to 90<sup>o</sup>C for 15 seconds. Milk should not be boiled even once. For this we can have a thermometer at home to measure the temperature or we should heat the milk up to that level where it is just going to boil. At the same time we should quickly cool it. We should heat the milk only once or twice. We should consume the milk within two heating at about 80<sup>o</sup>C to 90<sup>o</sup>C for 15 seconds.

Since we are heating milk at 80<sup>o</sup> to 90<sup>o</sup>C for 15 seconds only twice maximum. It will kill all the pathogens in the milk. Since we are cooling it quickly, exposure time at high temperature will decrease and thus % of loss of milk nutrients will also decrease. Thus we can have maximum benefit of milk.

#### **Methods and Materials**

It is very difficult to use pasteurization process for milk at home. To make the milk more safe as in pasteurization process. The milk must be heated at about 80<sup>o</sup>C to 90<sup>o</sup>C for 15 second so that all pathogens like yeasts, molds, bacteria and viruses are killed. The suggestion to cool the heated milk quickly is to decrease the heat exposure time so that % of loss of milk nutrients decrease much. We can have a thermometer of caliber 300<sup>o</sup>C at home, it is very safe. If we do not want to use thermometer or thermometer is not available at home. In this situation we should heat the milk in medium saucepan up to that level where it is just going to boil for 10 to 15 seconds and put the milk saucepan open in water container but water should not enter in milk saucepan. Thus milk will cool quickly and all the nutrients of milk would be safe.

#### **Result and Discussion:**

Milk is very costly. It is very necessary to use milk properly. Due to raw milk consumption in Europe and U S. There was a epidemic of bovine (cow)

tuberculosis (T B) in Europe and U S in 1900. Nearly 60000 people were died in about 25 years. Due to this problem of raw milk, pasteurization process was introduced.

During this low heating ( at about 80<sup>o</sup>C for 10 to 15 seconds ) of milk, there is not significant loss of proteins, vitamins , and minerals. very minor loses of water soluble vitamins C, B12, B6, B9, B1 are found. While fat soluble vitamins- E, D, A, and K are very minimally losses in this process. The milk is main source of calcium phosphate, proteins, and vita-B12 which are maintained during this low temperature heating.

About 250 ml of this milk contain about 25 % of calcium phosphate of daily value. Raw and this low temperature heated milk contain antimicrobials like bacteriocins, oligosaccharides, xanthine oxidase, lysozyme, immunoglobulin, lactoferrin and lactoperoxidase.

If we boil the milk several time it will loss maximum amount of all vitamins, calcium phosphate, minerals, proteins etc.

Thus it is very essential that we heat the milk at about 80<sup>o</sup>C to 90<sup>o</sup>C for 10 to 15 seconds, cool it quickly and keep the milk in refrigerator for maintaining its all nutrients.

#### **Conclusion**

Thus it is clear from this research paper that we should avoid raw milk as far as possible because it ultimately lead to diseases like TB, intestinal infections and stomach pain, disease- causing germs, such as Campylobacter, E. coli, and Salmonella." But at the same time several time boiling of the milk at home will make it devoid of maximum nutrients such as vitamins, proteins, calcium and iron etc.

At the same time pasteurization of milk is not possible at home. 99% of people of any community are unable to do pasteurization process at home. Thus pasteurization is good to make milk more healthy but it does not seems feasible at home.

Thus the only way remains to make milk healthy is to heat the milk at about 80<sup>o</sup>C to 90<sup>o</sup>C for 15 seconds. It is the temperature where milk is just start to boil. Now cool the milk as quick as possible to avoid the milk at high temperature exposure for long time.

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