An analytical study on shelf-life of milk and acceptability of milk products in household refrigerators

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ABSTRACT

Indian housewives make intensive use of milk and milk products in their cuisine and due to climatic conditions of the country, need refrigerated storage of these items. However, the power cuts and materials they choose to store them makes safety of such products questionable. Keeping this in mind, the present study was conducted with the objective to examine existing refrigerated food storage practices pertaining to milk and milk products, to undertake organoleptic evaluation of selected milk products and blue methylene test of milk. Results indicated that milk products with longer shelf-life remained unaffected with type of container used to store them in refrigerator, compared with milk samples, *malai* and yoghurt. Methylene blue reductase test of *verka* milk indicated that boiled milk can be stored in refrigerated conditions for 4 days. These results are indicative of change in physical appearance as well as non safety of raw milk storage for longer duration in household refrigerators.

INTRODUCTION

Milk and milk products need to be stored under refrigerated conditions. Refrigeration preserves the taste, texture and nutritional value of milk and milk products better than any other preservation method and as a result, refrigerated food market has experienced enormous growth. Refrigeration is employed to control the rates of certain chemical and enzymatic reactions as well as rates of growth and metabolism of food microorganisms (Srivastava and Kumar, 1994). By cool storage, we generally mean storage temperature above freezing and its maximum limit of 16^0C. However, temperature in danger zone $(16-49^0$C) allows rapid growth of bacteria and production of toxins by some bacteria (Sri Lakshmi, 2005).

Factors that reduce the shelf-life of milk include having the refrigerator temperature set too high. Ideally, the refrigerator should be at 38^0 to 40^0F, or as cold as you can keep the refrigerator without freezing milk and milk products. The low temperature will slow bacterial growth, while the sealed container will prevent contamination and absorption of flavours from other foods in the fridge. However, if the milk develops an off-odor or taste, it should be discarded. Storing dairy products in their original packaging with a securely closing lid will help decrease spoilage. In case of other dairy products, such as cheese and yoghurt, bacteria play an important role in flavour, function and good health.

Time and temperature are important factors in ascertaining milk and milk product's shelf life. Household refrigerators usually run at $4.4-7.2^0$C. Perishable foods like milk needs to be stored in the refrigerator at a temperature between $3-4^0$C. Moreover, studies have shown that perishable food like milk and milk products will deteriorate, even at refrigerator temperature, due to spoilage because of microorganisms, enzymes and oxidation (Jay, 2000). Moreover, the temperature and climatic conditions prevalent in India; as well as the pH values of most food items are conductive to growth and proliferation of bacteria causing food borne diseases.

Various kinds of containers (metallic and non-metallic), wraps, and covers are used by housewives for storing milk and milk products (Sri Lakshmi, 2005). However, there are