

An Improved Method to Produce Cholesterol Reduced Dairy Cream and Skimmed Milk Directly from Pasteurized Non-Homogenised Milk with Single Step Centrifugation

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There is a strong positive correlation between serum cholesterol level and coronary heart diseases. Due to the effect of dietary cholesterol on serum cholesterol levels, the removal of cholesterol from milk and other dairy products is a process that has attracted great interest. The use of β -cyclodextrin has been reported as an effective method to remove cholesterol from milk and other dairy products, though studies have not been conducted to assess the effect of cholesterol removal process on the other milk constituents. The purpose of this study was to assess the effectiveness of the cholesterol removal process under different conditions (cyclodextrin percentage, mixing time, centrifugal force) and to assess the effect of this process on the availability of lactose, solid non-fat, fat, protein and salt in milk. Different β -cyclodextrin percentages (0.5, 1.0, 1.5, 2.0, and 2.5) were added to milk, stirred and the mixture was then centrifuged. The upper layer and the middle layer were analysed separately. Pasteurized non-homogenized milk provided the highest cholesterol reduction with 2% β -cyclodextrin which was mixed for 5 min and centrifuged at 2000 rpm for 10 minutes. It provided 67.3% and 70.7% cholesterol reduction in the upper layer and the middle layer respectively. Fat, solid non-fat, lactose, salt and protein percentages of milk were significantly ($p < 0.05$) affected during the cholesterol removal process. The ultimate effect was different depending on the milk constituent and the conditions of the cholesterol removal process. Fat percentage of resulted upper and middle layer was 0.22% and 11.77% respectively, which can be called cholesterol-reduced skimmed milk and dairy cream respectively according to the United States Department of Agriculture regulations. Hence, this method can be recommended as an improved method to produce cholesterol-reduced dairy cream and skimmed milk directly from pasteurized non-homogenised milk treated with β -cyclodextrin with single-step centrifugation where-in tested regular methods, milk should undergo centrifugation twice to achieve that.

Keywords: β -cyclodextrin, Complex formation with cholesterol, Main milk constituents, Dairy cream, Skimmed milk