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**HYDROGEN PEROXIDE IN MILK; ITS ESTIMATION  
AND POSSIBLE EFFECTS ON THE QUALITY OF MILK**

A PROJECT REPORT PRESENTED

BY

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**ABSTRACT****HYDROGEN PEROXIDE IN MILK; ITS ESTIMATION  
AND POSSIBLE EFFECTS ON THE QUALITY OF MILK****H.P.P.S.SOMASIRI****BOARD OF STUDY IN CHEMICAL SCIENCES M.Sc**

A High Performance Liquid Chromatographic method for the determination of hydrogen peroxide in milk based on the oxidation of non-fluorescent acetaminophene to fluorescent p-benzoquinone with hydrogen peroxide in acidic medium, was investigated. The calibration graph was linear in the range  $5.88 \times 10^{-10}$  mol dm<sup>-3</sup> to  $1.47 \times 10^{-8}$  mol dm<sup>-3</sup> hydrogen peroxide at an emission wavelength of 333 nm with excitation wavelength at 298 nm ( $r=1.00$ ,  $R^2=0.99$ ). The method has a minimum detection limit of  $7.6 \times 10^{-10}$  mol dm<sup>-3</sup> of hydrogen peroxide, which is lower only to the available chemiluminescence methods. The method is applicable for the determination of hydrogen peroxide in milk with a recovery of 96%.

Variation of hydrogen peroxide concentration in milk with storage time was investigated using this method. Results showed that within the four hours of storage more than 50 % of the added hydrogen peroxide is dissociated while only about 15 % of added hydrogen peroxide remains after storage for 24 hours.

Deteriorating effects of milk fat and effect on the concentration of metal ions in the milk upon addition of hydrogen peroxide were investigated simultaneously. The fatty acid profile of fresh milk and milk samples treated with different concentrations of hydrogen peroxide and also with the different storage time were investigated. Fat was

separated by the Rose-Gottlieb method and fatty acid profile of each sample was obtained using Gas Chromatography after esterification of the fatty acids.

Results showed that addition of hydrogen peroxide for preservation of milk causes significant changes in unsaturated fatty acid composition of milk. The degree of these changes increases with the increasing concentration of added hydrogen peroxide and also with the increasing contact time.

Particularly the change in concentration of Oleic acid (C18:1) which is the major unsaturated fatty acid in milk is higher when compared to the other minor unsaturated fatty acid concentrations.

Metal contents of treated milk were also investigated with flame photometry and atomic absorption spectrophotometry. Results showed that addition of hydrogen peroxide to milk has no effect on the concentration of metal ions in milk.