

The use of the Fourier Transform Infrared (FTIR) spectroscopy to determine the formalin in raw milk and its impact on milk composition

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ABSTRACT

Introduction: Milk is an excellent source of nutrients for infants, children as well as adults. Milk's widespread consumption makes it a target for more potential adulteration. Formalin is a substance that is frequently added to milk because it inhibits bacterial growth and increase shelf life. Therefore, a high-precision machine is required to detect adulterations to ensure the safety of the milk and the quality of the milk composition. **Objective:** The purpose of this study was to validate the accuracy of the MilkoScan Mars FTIR spectroscopy machine in detecting formalin in raw milk samples and to investigate the effects of formalin on raw milk compositions. **Materials and methods:** Milk samples were obtained from samples received in Biochemical Section, Veterinary Research Institute (VRI). Milk that is free from any adulteration will be selected for this test. Five formalin concentrations (0.04%, 0.07%, 0.14%, 0.28%, 0.56% and 0% as a control) were used, with each concentration being read on the machine five times. **Results and conclusion:** The correlation between expected and observed values showed the best results with $R^2=0.9995$ and accuracy value was 0.006. The addition of formalin was effect the level of milk compositions. Results demonstrated that there was significant impact for milk composition at each type of formalin concentration tested at p value <0.05 except protein at concentrations of 0.04% and 0.07% with p values 0.178 and 0.523 respectively. Based on the findings, we can conclude that Milkoscan machine using the FTIR technique have high analytical performance in detecting formalin in milk.