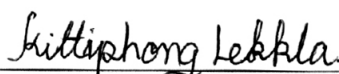
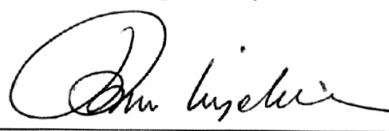


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The objectives of this research were to evaluate the efficiency of Ultrasonic Milk Analyzers (UMA) and to investigate certain influencing factors on milk fat content analysis. Four experiments were conducted. Experiment 1: Precision of Ultrasonic Milk Analyzers in analysis of milk fat content was studied. Two models, namely model-M and model-Ultra were used for the study. After calibration against mojonnier method precision for both models of UMA was found to improve. However, an average of 0.142 and 0.148% lower fat readings for the two respective models were observed. The precision parameters, i.e.  $S_p$ , r-value and RSD, for both UMA were not significantly different ( $P>0.05$ ) from the mojonnier method. The estimated time required for recalibration of UMA model-ultra was 60 days. However, UMA model-M needed no recalibration during this time interval. Experiment 2: The influence of milk fat content and fat globules size on fat analysis using UMAs was studied. Milk with higher fat content (%) as analyzed by both UMAs as well as mojonnier methods showed larger average fat globules size. A correlation coefficient between fat globule sizes versus % fat content was 0.933 and 0.916 for model-M and model-Ultra, respectively. Experiment 3: The milk fat globules size in raw milk when compared to homogenized milk using Single-stage and Two-stage at different pressures was studied. The different pressures used were 100, 150, 200, 250 and 300bar. Fat globules size in homogenized milk using Single-stage and Two-stage at different pressures was significantly ( $P<0.05$ ) smaller than those of the raw milk. A significant difference ( $P<0.05$ ) in milk fat content was observed between the raw and homogenized milk using Single-stage and Two-stage pressure. Two-stage homogenization parallel to the higher pressure applied tended to provide smaller ( $p<0.05$ ) fat globules size than the single-stage one and slightly higher ( $p<0.05$ ) fat readings by UMA model-M than the single-stage one. Experiment 4: The influence of temperature on precision of UMA in analyzing milk fat content was investigated. The raw milk samples were analyzed at different temperatures, i.e. 5, 10, 15, 20, 25 and 30 °C. The results showed an average increase in fat content by 0.01 % for every 5 °C increase in temperature of milk samples. However, the precision of UMA was not significantly different ( $P>0.05$ ) for the samples analyzed at different temperatures.

  
Student's signature

 24 / May / 2006  
Thesis Advisor's signature