

**NATIONAL UNIVERSITY OF SCIENCE  
AND  
TECHNOLOGY**

**FACULTY OF APPLIED SCIENCES**

**DEPARTMENT OF APPLIED CHEMISTRY**

*INVESTIGATION OF SUGAR (SUCROSE) LOSSES BEFORE AND  
DURING CANESUGAR REFINING AND METHODS OF  
MINIMISING / AVOIDING THE LOSSES.*

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## ABSTRACT

During cane sugar refining, the refiner suffers losses which are economically significant. Sugar is lost physically and chemically. The chemical losses are caused by operating pH and temperature. Microorganisms also break down sucrose. When sucrose is hydrolysed, it produces glucose and fructose. These cannot be recovered by crystallisation. This causes a loss to the refiner. The stations which were studied are melter, clarifier, liquor gallery, lump melter, sweet water tanks and raw sugar station. Analyses were made to determine quantitative sucrose loss at each stage in the refinery as pH and temperature vary. Microbiological tests were done and it was discovered that the sweet water tanks had counts as high as >800 colonies while the raw sugar which comes into the refinery had only 4 colonies. The findings of this project established that any temperatures above 80°C and pH below 7 cause severe losses to the refiner.

In order to keep losses at minimum levels it is recommended that operations be done at 70°C or below and that pH is kept between 7.5 and 8.0. If pH of sweet water is kept at 10 or above, it will minimise microbial growth. It is advised that the sweet water tanks be cleaned and sterilised regularly. Physical losses can be avoided by exercising caution and regular inspection of any leakages.