

FURTHER INVESTIGATIONS INTO THE BEHAVIOUR OF THE SUCROSE/CHLORIDE
AND REDUCING SUGAR/CHLORIDE RATIOS IN RAW JUICE CLARIFICATION.

I. INTRODUCTION.

A few years ago, investigators⁽¹⁾ in this Department, conducting researches in vacuum pan boiling, found it necessary to take accurate measurement and complete analysis of the products entering and leaving the pan, in order to determine the nature and amount of certain suspected reactions regarding the inversion of sucrose.

As a result of this, it was found that there was either considerable inversion of sucrose or considerable destruction of reducing sugars or both occurring under the conditions of the experiments, which was not fully demonstrated by standard methods of analysis. The standard analyses showed either an increase in purity when there was considerable sucrose hydrolysis or, at best, showed little or no change.

This is not quite as fantastic as it may seem, when one considers the methods by which results are obtained. The very nature and method of calculation of purity makes it a figure of doubtful value when it is remembered that % Total Solids is at least as prone to change as % Sucrose.

Consequently, it was decided to investigate the possibility of expressing results on another basis. The two obvious choices were % Potash and % Chloride. As these were both very soluble and, supposedly, passed through the process unchanged. Using these as bases, the results would be expressed as sugar to potash or chloride ratios.

Foster (2) who first investigated the possibility of using these ratios, considered % Potash unreliable, but found that % Chloride was entirely satisfactory in the evaporation stage. But even though the results for clarification differed from the

theoretical, he considered them more reliable than Sugar/Brix Ratios.

The following year, Dunlop continued the work on evaporation and crystallization and concluded that the % Chloride was reliable, as a basis for sugar:chloride ratios.

Dunlop (3) perfected the laboratory technique in the various methods employed, and, consequently, not much work was done on that this year. The object of this investigation was to continue Foster's work on clarification in an effort to determine the suitability of Sucrose/Chloride and Reducing Sugar/Chloride ratios as a basis of control.

Concurrent with this investigation, a comparison of the results obtained by estimation of % Sucrose by four different methods was also undertaken. This work, however, was entirely subsidiary to that on the behaviour of the Sugar/Chloride Ratios.

To this end, experiments were carried out in the laboratory, in which the conditions existing in the factory were closely simulated. Later, further experiments were performed on the appropriate products of a factory working under commercial conditions.