POSTER SUMMARY

DEVELOPMENT OF A JUICE PREPARATION TOOLKIT USING SMRI-NIRS

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Abstract

The combination of near-infrared spectroscopy (NIRS) technology and SMRI-NIRS analyte prediction equations has provided a rapid and cost-effective measurement solution for a host of sugar factory analytes in the South African sugar industry. The SMRI-NIRS toolkits are spreadsheet-based calculators that are used to convert the SMRI-NIRS predicted analytical results to performance parameters that support factories in decision-making. One toolkit under development aims to identify contributors to high undetermined sucrose losses (UDL) in the juice preparation section. The outputs from the toolkit include estimations of:

- Sucrose inversion loss across juice heating and clarification
- Sucrose loss during mud handling
- Impact of mixed juice tank returns (diffuser sumps, floor-washings or refinery returns) on boiling house recovery.

A three-day study was conducted in 2018 at a sugar mill that recycles clarifier mud to the diffuser. Sucrose inversion loss results indicated that losses were negligible across juice heating and clarification. The clear juice minus mixed juice (MJ) purity difference (MJ sampled before the MJ tank) was found to be a poor indicator of sucrose loss in the juice preparation section as the differences are very sensitive to the quality of streams being returned to the MJ tank. Furthermore, a consequence of the return of low purity streams to the MJ tank was a 2.3 unit drop in MJ purity feeding the clarification process and a potential increase in sucrose loss to molasses of about 20% by sugar, juice and molasses (SJM) recovery. The toolkit will be further developed during 2019 and the SMRI intends releasing this toolkit to its members in the 2020 season.

Keywords: juice preparation, sucrose, UDL, losses to molasses, inversion loss