

Consistency of the quality of palmyrah jaggery produced from palmyrah treacle during off season at a production facility in Jaffna

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Palmyrah (*Borassus flabellifer*) jaggery production from fresh sweet sap is seasonal (February to July). During off season, jaggery is produced from stored treacle which was produced from sweet sap collected during the previous season. In this study, we examined quality of 30 jaggery samples from randomly selected batches made from stored treacle at a community-scale production facility in Jaffna.

Sri Lankan standards (SLS) for Jaggery stipulate the following limits for quality jaggery: moisture <10%; total sugar >70%; reducing sugar <13%; ash <3.5%. Estimated means of jaggery samples were 4.6±0.7%, 87.4±2.9%, 8.5±0.5% and 1.7±0.2%, respectively. Respective coefficient of variations (CVs) were 15%, 3%, 6% and 12%. Attained crude protein content was 0.74±0.04% (CV=5%). Anderson-Darling (AD) test statistics for moisture (p=0.11), total sugar (p=0.11), reducing sugar (p=0.30) and protein (p=0.42) contents did not reject the null hypothesis that the sample considered comes from normally distributed population. AD statistic for ash content (p<0.05) rejected the null of normal distribution.

Means of calcium, sodium, potassium and phosphorus were 0.14±0.11%, 0.39±0.04%, 0.86±0.07% and 0.09±0.01%, respectively, which did not differ appreciably from literature values. Corresponding CVs spanned the range of 7 to 9%. AD statistics confirmed normal distributions for all minerals except for potassium (p<0.05). Means of pH and Brix value were 5.3±0.1 (CV=2%) and 19.5±1.0 (CV=5%). Estimated pH values showed a normal distribution (p=0.605) whereas Brix values did not (p<0.05).

We therefore concluded that moisture, ash, total sugar and reducing sugar contents of palmyrah jaggery samples tested confirmed well with the SLS for Jaggery. AD statistics led to the generalization of the above conclusion to the population of jaggery made during off-season at the said facility, except for ash content which was expected owing to the ad-hoc addition of low quality (40-50% purity) quicklime to sweet sap used for treacle and/or jaggery productions. The narrow range spanned by pH signified effective delimiting during processing of every batch. High values of CVs of moisture content and ash content and the non-normal distribution of ash content and Brix value call for tighter controls during jaggery processing to further enhance the consistency of the quality of jaggery produced at the production facility targeting international market.