IDENTIFICATION AND QUANTIFICATION OF MANUFACTURING LOSSES IN COCONUT MILK POWDER PRODUCTION

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ABSTRACT

Coconut milk powder (CMP) is a water dispersible solid obtained by drying an aqueous extract of coconut (*Cocos nucifera*) kernel. There is an increasing demand for CMP because it makes day-to-day food preparation convenient and helps to keep pace with today's busy lifestyle. Several drying techniques including hot air, vacuum, freeze and spray drying are used in commercial CMP manufacture. A Sri Lankan coconut milk powder manufacturing plant equipped with spray drying technique experiencing about 4.3% solid loss during its manufacturing process resulting an annual loss of about Rs.23 million. This case study was carried out with the main objective of identifying measures to minimize solid loss. Identifying solid losing points of above factory and quantifying the solid loss at identified points were the specific objectives of this study. The manufacturing process was divided into four sections; milk reception, liquid section, tipping section and drier section and solid loss points of each section were identified. Solid losses at identified points were quantified by sampling and analyzing the samples. Solid losses occur at the milk reception area due to transfer losses, solid remaining in bowsers and Coconut milk Buffer Storage Tank (CBST) were estimated. In liquid section, milk solid losses during filter changing and feed tank changeovers were estimated. Human errors in total solid analysis and rework bagging were identified in tipping section. In drier section, losses due to inaccurate use of tote bin scale and moisture analyzer were estimated. Sampling loss in drier section was estimated by recording number of samples taken and their weights.

As per the results, 92% of total solid loss occurred in milk reception section. Conductivity drain plate was the main loss point which accounted for 57% of solid loss at milk reception section whereas inaccurate moisture analysis and solid loss during transferring contributed to 21% and 14% of solid loss at this section.

Reducing the conductivity set point, standardizing the unloading process by plunging the compartment after half unloading and training on correct methods of rework bagging, plunging and total solid analysis using moisture analyzer, standardizing the required sample quantity and defining the sampling points can be recommended to reduce solid loss in commercial scale coconut milk powder production processes.

Key words: Coconut milk powder, Total solid content