



Contribution ID: 270

Type: Poster Presentation

Performance evaluation of a direct expansion bulk milk cooler on a dairy farm in the Eastern Cape Province of South Africa

Wednesday, 6 July 2016 16:10 (1h 50m)

Abstract content (Max 300 words) http://events.saip.org.za/getFile.py/?target=_blank **Formatting & Special chars**

This paper presents the performance evaluation of a direct expansion bulk milk cooler (BMC) used on a dairy farm in the Eastern Cape. The study was carried out on an existing dairy farm with an average of 800 cows in milking. The study focused on establishing the performance of BMC by the South African National Standards (SANS) 708:2007 for BMC's tanks. The performance evaluation of the BMC's considered morning and afternoon milking periods at an everyday collection of milk. A data acquisition system was installed to measure power consumption, the temperature of raw milk before cooling commences, the BMC room temperature, relative humidity, and ambient temperature. The volume of milk produced per every milking time was extracted from the on-farm records from fourth quadrant software. The cooling capacity of the BMC was determined for the two different milking times. The study revealed that an average of 60% of the day's milk extracted during the first milking. During this first milking, raw milk at an average temperature of 32°C attained a storage temperature of 4°C in 3 hours inclusive of the milking time. Also, after the last milking, the BMC operated for an average duration of 1.5 hours to before the raw milk attained the safe storage temperature. This short duration of cooling was owing to the slightly lower temperature lift of the stored milk from the storage temperature and also because of the volume of milk during that milking time which was lower than that of the morning milking time. The cooling capacity of the bulk milk tank was reduced due to an increased ambient temperature. Also, lower relative humidity increased the cooling capacity of the BMC and a decrease in the room temperature for the BMC lowered the cooling duration for the milk.

Apply to be considered for a student award (Yes / No)?

NO

Level for award (Hons, MSc, PhD, N/A)?

PhD

Main supervisor (name and email) and his / her institution

MSimon@ufh.ac.za

**Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?**

YES

**Please indicate whether
this abstract may be
published online
(Yes / No)**

YES

Primary author: Mr MHUNDWA, Russel (University of Fort Hare Institute of Technology)

Co-authors: Dr SIMON, Michael (FHIT); Mr TANGWE, Stephen Loh (Fort Hare Institute of Technology, University of Fort Hare)

Presenter: Mr MHUNDWA, Russel (University of Fort Hare Institute of Technology)

Session Classification: Poster Session (2)

Track Classification: Track F - Applied Physics