

Application of Osmometry in Monitoring Fermentation of Milk

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Abstract

Fermentation of milk yields many other products apart from lactic acid. This study was carried out to monitor the progress of fermentation by measuring the total solute concentration i.e. osmolality in fermenting milk. Five samples each of raw milk, pasteurised milk and UHT (ultra-high temperature treated) milk were incubated aerobically without starter culture at 37°C for 3 days. Osmolality was measured by freezing point depression at the beginning of incubation and at exactly the same time for the next 3 days. Osmolality of raw milk (mean±SD) increased from 290.2±8.0 to 405.6±31.06 mOsmoles kg⁻¹ in one day and stabilized around this value thereafter. For pasteurised milk, osmolality rose from 294.5±7.3 to a constant value of 403.4±18.2 mOsmoles kg⁻¹ in two days. Osmolality of UHT milk increased almost linearly from 289.3±3.3 to 472.7±10.1 mOsmoles kg⁻¹ over 3 days. The results showed that osmometry is a viable tool in monitoring the progress of milk fermentation. Using this method, maximum rate of spontaneous fermentation was obtained with raw milk, whereas maximum fermentation potential resided in UHT milk.