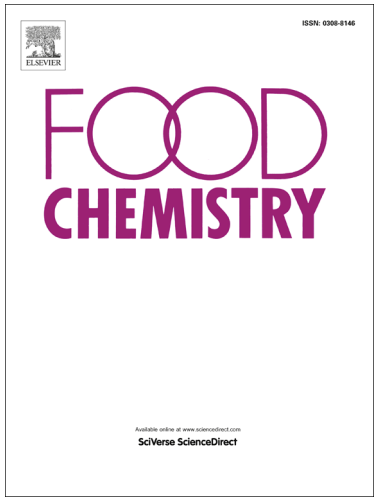

A comprehensive approach for milk adulteration detection using inherent bio-physical properties as 'Universal Markers': Towards a miniaturized adulteration detection platform

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PII: S0308-8146(16)31421-2
DOI: http://dx.doi.org/10.1016/j.foodchem.2016.09.037
Reference: FOCH 19817

To appear in: *Food Chemistry*

Received Date: 28 April 2016
Revised Date: 5 September 2016
Accepted Date: 6 September 2016

Please cite this article as: Tripathy, S., Ghole, A.R., Deep, K., Vanjari, S.R.K., Singh, S.G., A comprehensive approach for milk adulteration detection using inherent bio-physical properties as 'Universal Markers': Towards a miniaturized adulteration detection platform, *Food Chemistry* (2016), doi: http://dx.doi.org/10.1016/j.foodchem.2016.09.037

A comprehensive approach for milk adulteration detection using inherent bio-physical properties as 'Universal Markers': Towards a miniaturized adulteration detection platform

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Abstract:

This paper proposes a novel milk quality detection approach based on utilization of inherent biophysical properties as 'markers' for adulteration. Unlike the traditional adulterant-specific approaches, this method is generic and universal. It exploits the change in innate milk properties, such as electrical conductivity and pH, upon addition of adulterants as a transduction mechanism for detecting milk adulteration. In this work, adulteration with more than 10 commercially known hazardous adulterants is detected by monitoring the changes in milk electrical conductivity and pH. The electrical parameters for pure milk were standardized using AC Impedance-Spectroscopy with glassy carbon working electrode and platinum counter/reference electrode at a potential of 0.3 V and in the frequency range of 1 Hz -1 MHz. The experiments were repeated using gold-electrodes fabricated on glass-substrate as a first step towards

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