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Reliability of lactometers in the determination of specific gravity of milk

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One of the major problems associated with modern dairy farming is adulteration of milk with water, sugar, salt, starch like solids, in order to increase the volume. Specific gravity (SG) is used for the detection of adulteration and together with fat for pricing of milk. Therefore the objectives of this study was to compare the SG values measured by the gravimetric method with the values obtained by using different types of lactometers which are widely used in Sri Lanka and to check the reliability of lactometers and effects on specific gravity when milk is adulterated.

In the first experiment SG value of cow milk samples were collected from NLDB farms and private farms of the mid country were determined either by gravimetric method and using 6 types of lactometers (Zeal, BS 734, Dutch type, ISI, Benny and Field). As the second experiment the SG of purposely adulterated milk samples were measured using the 6 lactometers and the gravimetric method. The experimental design was a Complete Randomized Design (CRD).

SG values calculated using all six types of lactometers were different ($P<0.001$) from gravimetric method for cow milk. Further the gravimetric SG values (1.029±0.002) were always higher than that of calculated lactometer values (1.026±0.002). Benny, ISI and Field type lactometers (1.027±0.002) gave closer values to gravimetric method. Similarly gravimetric method gave higher SG of adulterated milk as compared with calculated values for all six types of lactometers. For solid type adulterants (sugar, salt, starch and urea), ISI and Benny gave similar values as compared to gravimetric method.

Generally it can be concluded that all the SG values obtained using gravimetric method were significantly higher than lactometer values, ISI and Benny were the best lactometer to measure the SG of adulterated cow milk, and Salt followed by sugar had the greatest effect on SG of cow milk while urea had the least effect.

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