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Relationships between the results of various methods of urea analysis in native and enriched milk

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[fulltext]

Milk urea concentration (MUC) is a suitable indicator of the health and nutrition state of dairy cows. MUC is in relation to their reproduction performance longevity and technological milk

of results depends on their reliability. There are a lot of principles of MUC analyses. Their results can be affected b a number of interferential factors. Disproportions were noticed in practice. Therefore the sources of variation in results are studied. The goal of this study was to investigate relationships between different methods of MUC determination with the use of standard samples of nativ milk with an artificial urea addition. After evaluation I ($n = 7$) the results of method BI-1 and BI-2 (photometrical ones with diacetylmonoxime) were disqualified because of poor recovery (R), poor correlation (C) with other methods, highe random error (RER) and highest systematic error (SE). Evaluation II is more effective with stricter discrimination limits. Cs of all methods mutually (0.977 up to 0.998; $P < 0.001$) confirmed the methods as effective with the exception c BI-2 with poor Cs (0.713 up to 0.774), poor R (16.0 up to 69.0%) and high RER ±5.292 mg/100 ml. R of better methods was 44.0 up to 96.7%. The BI-1 method had good Cs (0.986 up to 0.994; $P <$ 0.001), higher SE −7.546 mg/100 ml an poorer R (48.5 up to 75.3%). BI-1 metho

was a case of mistaken performance. BI method could be improved by the use of more samples in calibration. FT-MIR method (infra-analysis) has good additio R 69.5 up to 95.0% and Cs 0.981 up to 0.994 ($P < 0.001$). EH method (photometrical one with Ehrlich's agent) has good R 59.0 up to 96.7%, higher SE 4.755 (I) and 2.556 (II) mg/100 ml and close Cs 0.977 up to 0.994 ($P < 0.001$). UR method (ureolytical difference-conductometric) showed the best combination of results about R, C, SE and RER. MUC measurement was almos independent of fat in milk ($r = 0.16$ for UF and 0.01 for FT-MIR; $P > 0.05$) and MUC of both the methods did not increase significantly with lactose increase (($r = 0.16$ and 0.27; $P > 0.05$), which increased logically (($r = -0.88$; $P < 0.001$ during the fat concentration increase. Th relationship of MUC results between UR and FT-MIR was significant (validation ($r = 0.96$; $P < 0.001$) at average difference 0.93 ± 1.663 mg/100 ml. It is possible to see the result reliability as good after calibration performance of FT-MIR according to results of UR. It is not necessary to see the effects of fat, protein

and lactose on MUC methods as
substantial. FT-MIR method for MUC has