

# NOVEL MILK FAT EXTRACTION METHOD – A FASTER, ECONOMICAL AND HEALTH FRIENDLIER APPROACH

I. STEFANOV<sup>1</sup>, V. FIEVEZ<sup>2</sup>, Ghent University, Laboratory for Animal Nutrition and Animal Product Quality, Proefhoevestraat 10, BE-9090 Melle, Belgium

A novel method for the routine extraction of milk fat using dichloromethane ( $\text{CH}_2\text{Cl}_2$ ) (E1) was developed and compared to the Rose-Gottlieb (E2) (IDF Standard 9C, 1987) extraction procedure, as part of a larger experiment, which additionally involved the assessment of the effect of storage and thawing on the gas chromatographic and spectroscopic (MIR and Raman) results (data not shown). The extraction method consisted of a simple procedure involving direct mixing of raw cow milk samples with a previously prepared dichloromethane-ethanol(DE) solution (2/1, v/v) (milk/DE, 1/1.6, v/v). The results showed that generally (except for 5 of the 49 identified fatty acids) there was no effect of the extraction procedure on the individual fatty acid proportions (%FAME). None of the main milk FA groups MUFA, PUFA, SFA and OBCFA showed any significant difference between both E1 and E2. Total extracted milk fat showed no difference between the means of both extraction procedures, although the dichloromethane procedure tended ( $P < 0.1$ ) to extract about 5.2% less fat as compared to the Rose-Gottlieb method. The average analysis time for a batch of twenty 10mL raw milk samples using the new E2 method is approximated to about 30 minutes, which further could be shortened when combining more samples for being handled simultaneously. In comparison, the number of extractions, which our laboratory technicians perform using the reference E1 procedure is at maximum 24 per day (7 hours).  $\text{CH}_2\text{Cl}_2$  exposure time in E2 is 6 times less compared to solvents in E1, it's not toxic as petroleum ether and it has a threshold limit 20-25 times higher than that of chloroform, which used in other fat extraction procedures such as Folch and Bligh & Dyer. Also  $\text{CH}_2\text{Cl}_2$  is cheaper than most organic solvents. In general, the new dichloromethane extraction method was found to be much faster, less health hazardous, cost efficient and overall much more suitable for the gas chromatography milk fatty acids analysis in comparison with the older widely used Rose-Gottlieb extraction method.