Robust Analysis of Fatty Acids in Milk: An Independent Lifetime Evaluation of Rt-2560 GC Columns

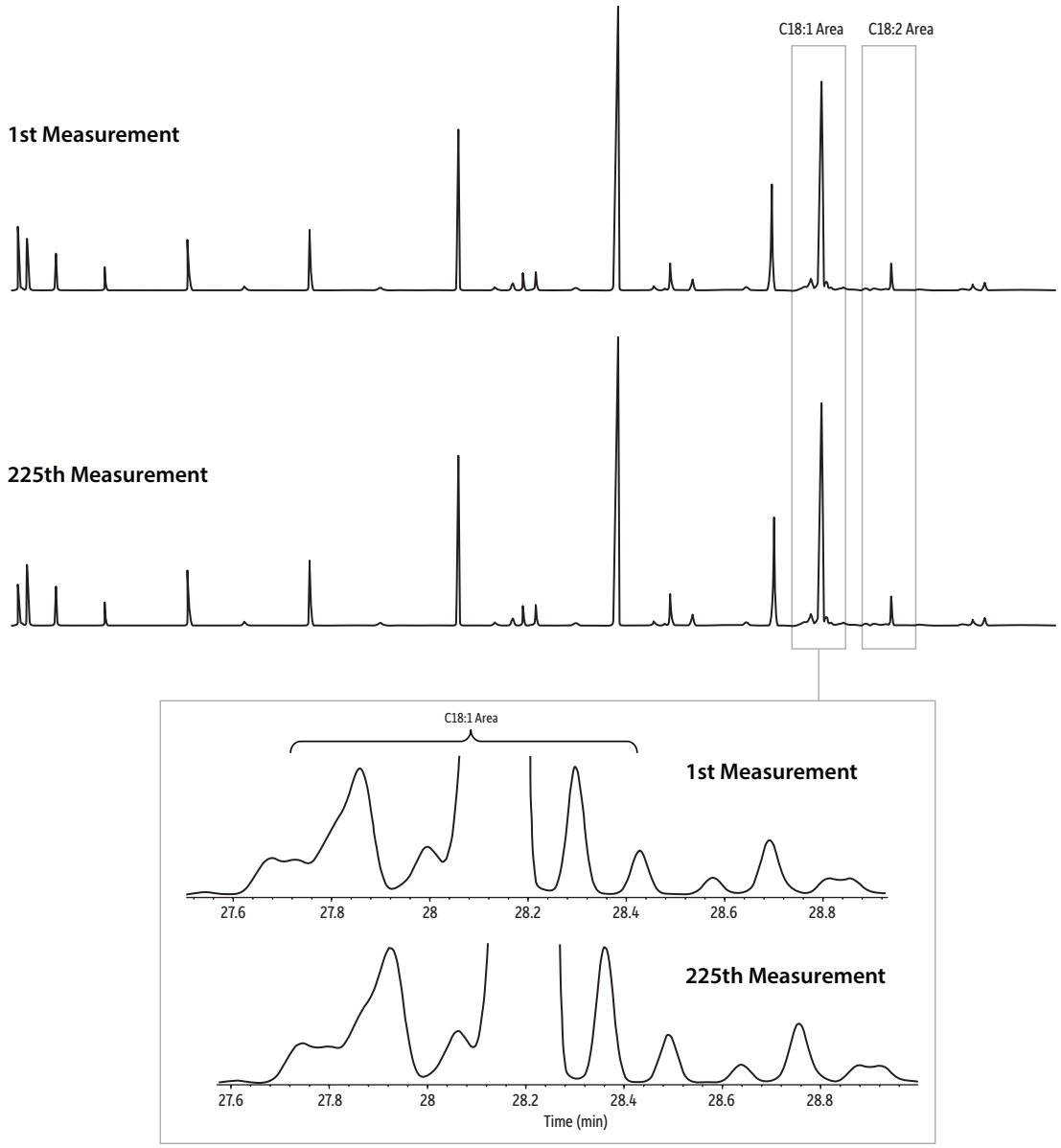
Whether characterizing edible oils or studying how foods affect health, assessing fatty acid composition is of global interest. Tremendous work is being conducted throughout the European Union to better understand the health implications of certain foods, and the analysis of fatty acids plays a central role in these efforts. European food scientists are working hard to harmonize methods and support regulations that will ensure the authenticity of edible oils and limit the consumption of industrial trans fatty acids (IFTAs), which have been linked to adverse health effects like heart disease [1].

A 100% biscyanopropyl polysiloxane capillary column (100 m x 0.25 mm ID, 0.20 µm film), such as an Rt-2560 column, is commonly used to profile fatty acids in food because it allows for the separation of fatty acid methyl esters based on chain length and degree of unsaturation. It can also resolve positional and geometrical isomerism of double bonds. However, coating a long column with a thin layer of highly polar stationary phase is extremely difficult, and even small manufacturing variations can have detrimental effects on quality and reproducibility. To ensure consistent performance, Rt-2560 columns are made using an optimized manufacturing process and tested using an application-specific quality control (QC) test [2].

While Restek tests every Rt-2560 column in our QC lab, we appreciate the efforts of scientists like Christiane Barthel (Eurofins Analytik GmbH) who conducted a rigorous lifetime test using milk fat samples to determine if the Rt-2560 column would be a useful and reliable tool for real-world testing. Milk fat is a particularly complex natural fat and it provides a challenging matrix for evaluating column performance. Testing was done using a modified version of ISO 12966-2 (esterification) for sample preparation, followed by GC analysis based on ISO 12966-4. As shown in Figure 1, consistent retention times and separations were achieved even after 225 injections, demonstrating the robust performance of the Rt-2560 column for the analysis of fatty acids in milk fat.

Restek would like to thank Christiane and Eurofins Analytik GmbH for conducting this assessment and contributing their expertise to the ongoing efforts that ensure food quality and safety around the world.

Figure 1: Rt-2560 GC columns consistently provide excellent chromatographic results for the analysis of fatty acids in milk.



GC_FF1291

Column	Rt-2560, 100 m, 0.25 mm ID, 0.20 µm (cat.# 13198)
Sample	Customer analysis of milk fat sample
Injection	
Inj. Vol.:	1 µL split (split ratio 100:1)
Inj. Temp.:	250 °C
Oven	
Oven Temp.:	120 °C to 240 °C at 4 °C/min (hold 7 min)
Carrier Gas	H_2, constant flow
Flow Rate:	1.7 mL/min
Detector	FID @ 250 °C
Notes	Sample was prepared following ISO 12966-2 (esterification) and analyzed following ISO 12966-4 using GC-FID.
Acknowledgement	Christiane Bartel, Eurofins Analytik GmbH

References

[1] D. Mozaffarian, A. Aro, W.C. Willet, Health effects of trans-fatty acids: experimental and observational evidence, Eur J Clin Nutr 63(S2) (2009) S5-S21. https://www.ncbi.nlm.nih.gov/pubmed/19424218
[2] K. Sellers, R. Stevens, Highly reproducible detailed cis/trans FAMEs analysis ensured by new optimized Rt-2560 column manufacturing and application-specific QC test, Application note, FFAR2589-UNV, Restek Corporation, 2016. https://www.restek.com/Technical-Resources/Technical-Library/Foods-Flavors-Fragrances/fff_FFAR2589-UNV

similar **phases**

HP-88, CP-Sil 88, SP-2560, BPX-90, MEGA-10

Rt-2560 Column (fused silica)
highly polar phase; biscyanopropyl polysiloxane—not bonded

- Stationary phase selectivity optimized for isomer separation to ensure accurate quantification of critical *cis*/*trans* FAMEs.
- Application-specific QC test guarantees consistent, reliable performance for AOAC 996.06 and AOCS Ce 1j-07 methods.
- Excellent sample capacity; no peak distortion means easy, accurate peak integration.
- Temperature range: 20–250 °C.

Description	temp. limits	qty.	cat.#
Rt-2560 100 m*, 0.25 mm ID, 0.20 µm	20 to 250 °C	ea.	13198

*Nominal length = 100 m. The actual length is 110 m, which is equivalent to the length of the previous Rt-2560 column (cat.# 13199).

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