



Easy Solution for Fatty Acid Analysis Using the Agilent 7820 GC System

FOOD



Highlights

37 FAMES compounds in milk are well separated in this easy solution based on the Agilent 7820 GC system.

Referenced Documents

GB/T21676-2008, Milk and dairy products—Determination of fatty acid content

5989-3760EN, Column Selection for the Analysis of Fatty Acid Methyl

Abstract

This application brief describes an easy and economical GC/FID based solution for the analysis of fatty acids in milk and dairy products. The fatty acids were converted to FAMES using the acetyl chloride-methanal methyl esterification method.

37 FAMES were well separated in this method and the Agilent 7820 GC system with FID provides a reliable result at an easily affordable price.

Introduction

Milk contains approximately 3.4% total fat. Milk fat has the most complex fatty acid composition of the edible fats. Over 400 individual fatty acids have been identified in milk fat. However, approximately 15 to 20 fatty acids make up 90% of the milk fat.

The major fatty acids in milk fat are straight chain fatty acids that are saturated and have 4 to 18 carbons (4:0, 6:0, 8:0, 10:0, 12:0, 14:0, 16:0, and 18:0), monounsaturated fatty acids (16:1, 18:1), and polyunsaturated fatty acids (18:2, 18:3). Some of the fatty acids are found in very small amounts, but contribute to the unique and desirable flavor of milk fat and butter. For example, the C14:0 and C16:0 β -hydroxy fatty acids enhance the flavor of butter by spontaneously forming lactones when heated.



Different types of fatty acids play different role to human health, and that is why the fatty acids analysis has attracted a significant interest and attention.

GC conditions

Injector temperature 200 °C
Injection volume 1 µL
Carrier N₂, 1 mL/min
Split ratio 30:1
FID temperature 300 °C
Make up flow 25 mL/min
H₂ flow 40 mL/min
Air flow 400 mL/min
Oven program 50 °C (1 minute),
25 °C/min, to 175 °C, hold (0 minutes),
4 °C/min, to 230 °C, hold (4 minutes)
Column DB-23, 60 m × 0.25 mm × 0.25 µm
(p/n 122-2362)

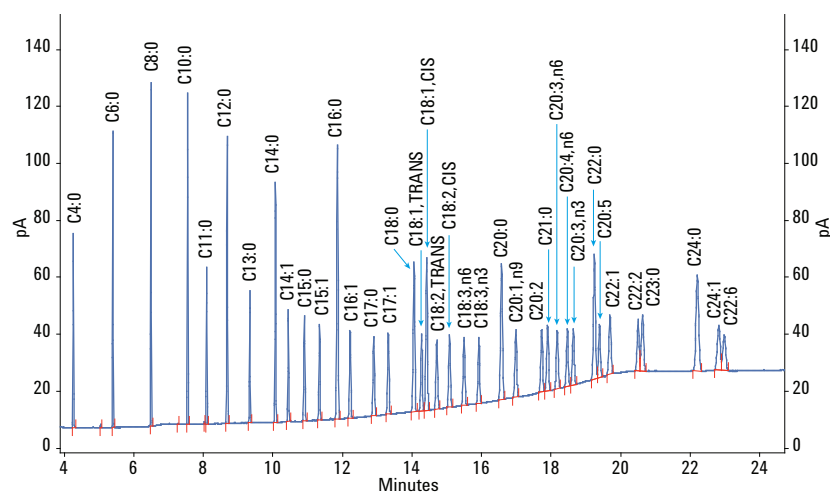


Figure 1. Chromatogram of 37 FAME standards mix.

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