



## Full F.A.M.E. Analysis



# F.A.M.E. Profiling

Fatty acid profiling is the process of analysing ratios of individual fatty acid content within an oil sample to generate the authenticity as well as nutritional information for labelling requirements.

In diets there are three main categories of Fatty acids; Essential, Unsaturated and Saturated. Essential Fatty Acids are required for a healthy metabolism, however the human body is incapable of producing these within the body; These Essential Fatty Acids need to be ingested.

Unsaturated Fatty Acids have one or more double bonds between carbon atoms. These can form structural isomers called cis or trans. Trans Fatty Acids have been heavily linked to increased cholesterol levels as well as several other negative health impacts. It is widely accepted that ingestion of Trans Fatty Acids should be avoided where possible.

Saturated Fatty Acids have no double bonded carbon atoms. Some Saturated Fatty Acids have been linked to higher cholesterol levels and an increase in heart disease, others have been linked with little or no negative impact on health.

The most commonly analysed are olive and sunflower oil. Both oils contain primarily different ratios of oleic acid (C18:1) and linoleic acid (C18:2), but can contain a variety of saturated and unsaturated fatty acids ranging from palmitic acid (C16:0) to behenic acid (C22:0), as well as the cis/trans isomers within this range.

To analyse free fatty acids, they must first be derived to their FAME (fatty acid methyl ester) equivalent. Many commercially available derivatisation kits are suitable for this process. For this analysis we used 0.25 M Trimethylsulfonium Hydroxide in Methanol.

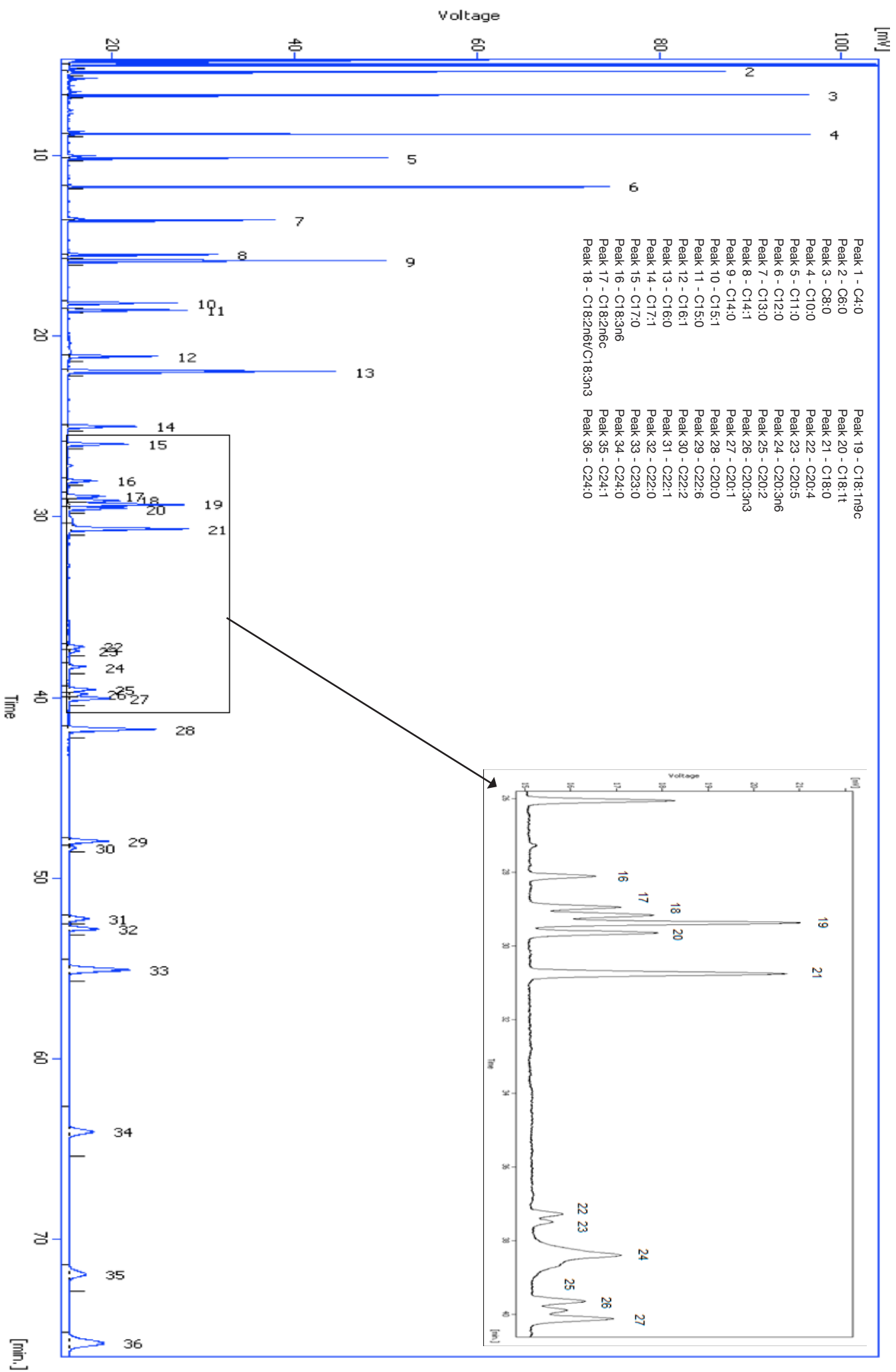


## GC Conditions

Injector Temp	250°C
Carrier Gas Type	Nitrogen
Carrier Gas Control Method	Simulated Constant Flow
Column Flow	1.5 ml min <sup>-1</sup>
Split Flow	115 ml min <sup>-1</sup>
Injection Volume	1.0 µl
Column Type	EL-1 60 m x 0.25 mm x 0.25 µm
Initial Temperature	140°C/Hold 2 min
Temperature Ramp 1	200°C
Upper Temperature	200°C
Detector Temperature	250°C

The Ellutia 200 series Gas Chromatograph was utilised along with an EL-1 column. The EL-1 column was used to separate all of the components in the sample. A more selective column can be used to target the wanted components.

The figures show that the sample was successfully separated into its individual components. By using a reference table the user can identify which components have been distinguished by the Gas Chromatograph.



## Ordering Guide

Ellutia 200 Series Gas Chromatograph, FID  
EL-1 Capillary Column, 60 m x 0.25 mm x 0.25 µm  
Ellution Software, Single Instrument

(Part no. 20500130)

(Part no. 51100038)

(Part no. 23001001)

## Optional:

Ellutia EL3100A Automatic Liquid sampler - 15 position  
Ellutia EL3000A Automatic Liquid Sampler - 121 position  
Ellutia EL3200A Automatic Liquid Sampler - 209 position  
Autosampler Control Software

(Part no. 30500011)

(Part no. 30500010)

(Part no. 30500012)

(Part no. 23001012)

## Accessories

2 ml Vials  
2 ml Vials screw Caps  
1 µl Liquid Syringe  
Septa

(Part no. 20511101)

(Part no. 20511107)

(Part no. 20511204)

(Part no. 20512101)

## Solutions required

Trimethylsulfonium hydroxide in Methanol

