

**Fatty acids in food supplements:
*Can you assume what you consume ?***

Session 3

Introduction

In Session 2, you continued working with your lipid extracts and converted all of the fatty acids (and triglycerides) to their methyl esters (FAMES) in preparation for analysis by GC or GC-MS in this final session.

The aim of this session is to determine the structures and distributions of the individual fatty acids in the food supplement capsules (Objective 3) and use these data with the gravimetric data from Session 1 to address Objectives 4 and 5.

Method

You will be provided with a GC or GC-MS chromatogram of a mixture of commonly occurring fatty acids (analysed as their FAMES) together with the mass spectra for the individual compounds. Use these data to:

- (a) Identify the compounds (e.g. C_{16:0}).
- (b) Determine their elution order – compare this with your predicted order from the Session 3 pre-laboratory exercise.

Analyse your mixtures of FAMES by GC or GC-MS, tabulate the numerical data and calculate the distributions of the individual FAMES. Combine these composition data with your gravimetric data from previous sessions to determine the masses of individual fatty acids and fatty acid classes (saturated, omega-3, etc). Repeat these calculations for the data obtained by other members of the group working on different sources of fatty acids.

Preparation for Final Report

Compile all relevant data from the individual sessions and determine how each of these data align with individual objectives and the overall aim.

**SEE ACCOMPANYING DATA SHEET FOR TYPICAL FATTY ACID
DISTRIBUTIONS FROM DIFFERENT SOURCES**

Laboratory Report

This study into fatty acids in food supplements has provided you with an opportunity to complete a reasonably in-depth practical investigation over a series of sessions. Your final report should adhere to the following guidelines (with word limits):

Introduction – An outline of the aims of the investigation (100 words)

Background to Fatty Acids – A summary of the chemical features of these chemicals and their perceived health benefits. (200 words)

Methods – A brief overview of the methods and techniques employed in the practical work (100 words)

'Storyline' – A session-by-session account of how the investigation progressed (100 words)

Results - Tabulate all of your findings including masses and % recoveries where appropriate. Show any calculations that you consider to be important.

Discussion – This section should be an integration of all of your findings. You may want to consider the following questions but you are also encouraged to think of some of your own:

- (1) Are there any differences between the different sources (capsules) of fatty acids ? If so, what are they ?
- (2) What are the main conclusions from your investigation and how did you arrive at these ?
- (3) How do your conclusions align with the various objectives, 'current concerns' and points raised through the pre/post-laboratory exercises ?
- (4) If you were asked to recommend a source of fatty acids from those analysed, which one would it be and why ?

Discussion (extended) – The overall aim of this study can be described in terms of whether fatty acid-based food supplements are what they claim to be (*Can you assume what you consume ?*). Various assumptions have also been made whilst investigating this aim, particularly during the experimental procedures that you have followed, together with the subsequent interpretation of results. Re-trace the procedures/interpretations and identify these assumptions.

Finally, are any questions that have not been fully addressed ? How could these be resolved experimentally ?

References – A summary of where you have found reference data

Author	Simon Belt
Title	Fatty Acid Supplements
Classification	Laboratory Manuals - Chemistry
Keywords	ukoer, fatty acids, food, chemistry, analytical, GC
Description	Individual lab sheets - Tutor
Creative Commons Licence (url)	http://creativecommons.org/licenses/by-nc-sa/2.0/uk/
Language	English
File size	60 kB
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