

ABSTRACT

Protein and lipid analysis is of great importance in the food and feed industry. Whereas, protein and lipid are essential conventional components of food. But, analysis of a sample using methods is time consuming to carry out for food production. So, there is a need for rapid methods for estimation of protein and lipid in foodstuff. This study was done to investigate the use of spectroscopic techniques for performing protein and lipid analysis in some food and feed samples. IR spectroscopy, Raman spectroscopy and spectrophotometry were employed in this investigation.

The results of spectroscopic methods showed a good agreement with the results of the conventional methods. The correlation coefficients between the spectroscopic methods' results and the conventional methods' results were found to be (0.97-0.99) for protein and lipid analysis by different used methods.

Hence, well established spectroscopic methods – especially IR and Raman spectroscopy – can be concepted as quick, easy and inexpensive methods for quantitative measurements of protein and lipid in food and feed products without the need for pre-measurement treatments for the samples.

CONTENTS

	Page
List of figures	3
List of tables	4
Abstract	6
Chapter (1): Introduction	7
Chapter (2): Review	10
Chapter (3): Theory	19
3-1 Conventional Techniques	19
3-1-1 Kjeldahl technique for protein analysis	19
3-1-2 Soxhlet method for lipid analysis	20
3-2 Spectroscopic Techniques	21
3-2-1 Fourier Transform Infrared (FTIR)	
Spectroscopy	21
3-2-2 Raman Spectroscopy	25
3-2-3 Spectrophotometry Technique	29
Chapter (4): Materials and methods	32
4-1 Conventional method for protein analysis	32
4-2 Conventional methods for fat analysis	35
4-2-1 Method (1)	35

4-2-2 Method (2)	37
4-3 Spectroscopic Methods	38
4-3-1 FTIR Technique	40
4-3-2 Raman Technique	42
4-3-3 Spectrophotometry Technique	44
4-3-3-1 Analysis of Protein	44
4-3-3-2 Analysis of lipid	45
Chapter (5):Results and discussion	
5-1 Conventional Methods	48
5-2 Spectroscopic Methods	48
5-2-1 FTIR Spectroscopy	50
5-2-2 Raman Spectroscopy	71
5-2-3 Spectrophotometer Method	90
Conclusion	100
Review references	102
References	109
Arabic abstract	115