

Cork Institute of Technology

Bachelor of Science in Food Science & Technology - Award

(NFQ Level 7)

Spring 2007

Food Toxicology

(Time: 2.5 Hours)

Answer six questions

Answer two questions from Section A.

Answer two questions from Section B.

Answer two questions from Section C.

Please use separate answer books for each section.

All questions carry equal marks.

Examiners:

Mr. B. Walsh

Dr. D. Gilroy

Dr. A. Furey

Prof. R. J. Fitzgerald

Section A

- Q1. (a) Define a food additive. (6 marks)
- (b) Write a brief note on the safety aspects of food additives. (6 marks)
- (c) Briefly describe the general principles on the use of food additives. (8 marks)
- Q2. Write notes on pesticides under the following headings:
- Definition.
- Classification.
- Use. (20 marks)
- Q3. Write a short essay on microbial toxins. (20 marks)

Section B

- Q4. (a) Describe the principle and applications of the Ames test. (10 marks)
(b) How is the maximum acceptable total residue level of a veterinary drug calculated? (10 marks)
- Q5. (a) Outline the principle and applications of the Delvo test. (10 marks)
(b) Describe how foreign substances may pass through biological membranes? (10 marks)
- Q6. Write short notes on four of the following topics in relation to toxicology:
- (a) LD₅₀
 - (b) NOAEL
 - (c) ADI
 - (d) Paracelsus
 - (e) Therapeutic index (20 marks)

Section C

- Q7. (a) “Standard addition must be used whenever the matrix of a sample changes the analytical sensitivity of the method. In other words, the slope of the working curve for standards made with distilled water is different from the same working curve made up in a food extract”.

In relation to quantitation in analytical chemistry and food toxicology, discuss the above statement. (6 marks)

- (b) Describe how you would carry out a standard addition experiment? Diagrams may be included. (8 marks)
- (c) Give examples in food analysis for the application of standard addition? (6 marks)

- Q8. “Samples extraction followed by solid phase extraction (SPE) clean-up are essential requirement prior to the detection of chemical residues in food by GC and/or HPLC”.

- (a) Discuss this statement in relation to food preparation for chemical analysis. (10 marks)
- (b) What SPE stationary phases are available to the biologist for analyte purification and sample clean up? (5 marks)
- (c) What validation must be carried out to prove adequate recoveries are obtainable at both the extract and clean-up steps? (5 marks)

- Q9. Write a short essay on the topic of Food Toxicology.

In your answer discuss a testing protocol you would develop for one of the following situations:

- (a) to detect and quantify the hydrocarbon contamination of shellfish caused by an offshore oil spill,
- (b) to test and quantify heavy metals contamination in prepared vegetable baby foods.

(20 marks)

