

Cork Institute of Technology

Bachelor of Science in Food Science and Technology - Award

(NFQ - Level 7)

December 2005

Food Toxicology

(Time: 2.5 Hours)

Answer five questions
Answer two questions from Section A.
Answer two questions from Section B.
Answer one question from Section C.
Please use separate answer books for each section.
All questions carry equal marks.

Examiners: Mr. B. Walsh
Dr. D. Gilroy
Dr. M. Lehané
Dr. T. Beresford

Section A

Q1. (A) Write concise notes on the following

- (i) European food safety authority
- (ii) Codex alimentarius
- (iii) Food and drugs act
- (iv) 1958 Amendment to the food, drugs and cosmetic act

(8 marks)

- (B) (i) What is the purpose of the HACCP system and what are its advantages?
(ii) What are the principles of a HACCP system?

(12 marks)

Q2. Describe the various types of microbial toxins associated with food toxicology.

(20 marks)

Q3. (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)

Section B

Q4. Write short notes on the following in relation to toxicology:

- (a) LD₅₀
 - (b) NOAEL
 - (c) ADI
 - (d) Paracelsus
 - (e) Therapeutic index
- (20 Marks)

Q5. (a) Describe the ways in which foreign substances may pass through biological membranes. (10 Marks)

(b) Using a flow diagram, outline the various stages of toxication that can occur within living organisms. (5 Marks)

(c) Describe what is involved in setting up a subchronic toxicity test. (5 Marks)

Q6. (a) Describe the Ames test. (12 Marks)

(b) What are the differences between acute and chronic toxicity? (4 Marks)

(c) What are the general requirements for conducting *in vivo* toxicity tests? (4 Marks)

Section C

Q7. 'Many food borne biotoxins are present in trace quantities in very complex matrices, therefore reliable, reproducible and validated sample collection, analyte extraction and sample clean up protocols are critical to ensure human safety'. Discuss. (20 Marks)

Q8. Discuss a strategic approach to the resolution of the following problems:

- The determination of pesticide residues in a consignment (several tonnes) of oranges imported from Valencia, Spain.
 - The use of solid phase micro extraction (SPME) to the determination of the petroleum levels in mackerel following a minor oil spill from a tanker off the southwest coast of Ireland.
 - The use of solid phase extraction (SPE) to determine toxin X (a moderately polar tri carboxylic acid toxin present at the µg/g level) in oysters harvested in Bantry Bay.
- (20 Marks)