

Mastership in Chemical Analysis

Part B Examination

Paper 1

Burlington House

28 October 2008

1300 – 1600

Instructions

Answer **five** questions out of eight.

The answers to each section must be returned in the examination script booklets provided. All examination scripts must be handed in at the end of the examination.

The marks allocated to each section are given.

- 1 In the context of food microbiology discuss, with examples, what is meant by the following:
 - (a) Spoilage organism, indicator organism and pathogen. **(10 marks)**
 - (b) Microbiological standard, microbiological guideline and microbiological specification. **(10 marks)**

- 2 You have been asked to write a Standard Operating Procedure for the investigation of foreign bodies in food. Describe the main features that it would be necessary to include in such a document. **(20 marks)**

3 Use of novel, synthetic or substitute compounds in foods is becoming more prevalent. For **five** of the following, give their class and function, what they replace and an example of their use.

- (a) Salatrims
- (b) Maltitol
- (c) Phytostanol Esters
- (d) Carboxymethylcellulose
- (e) Copper Chlorophyllin
- (f) Sodium Cyclamate
- (g) Ethyl vanillin

(4 marks each, total 20 marks)

4 (a) Several approaches are available for a meat producer to evaluate the declarable meat content of a meat product such as a type of sausage. Critically discuss the advantages and disadvantages of the available methods. **(14 marks)**

(b) Use the FSA approach to calculate the meat content of a pork sausage with the following recipe. Explain your calculations.

(6 marks)

Description	Type	Meat %	Quantity
Beef 65 VL	Beef	78	4.5kg
Pork 70 VL	Pork	90	14.0kg
Pork Fat			4kg
Sausage Additive Mix			500g
Water			2 litres

Sausage Additive Mix:

Ingredients:

Rusk	24.8kg
Sodium Metabisulphite	0.1kg
Colour - Ponceau 4R	0.01kg
Herbs and Spices	0.09 kg

5 (a) For **two** of the following mycotoxins give an outline of their occurrence, stability and methods of minimizing levels in foods for human consumption.

- (i) Patulin
- (ii) Ochratoxin A
- (iii) Zearalenone

(12 marks)

(b) “When assessing compliance against a standard the sampling uncertainty should be assumed to be zero”. Discuss this statement in the context of mycotoxins.

(8 marks)

6 (a) Omega-3 fatty acids are subject to increased interest as nutritional supplements. What are Omega-3 fatty acids, and how are they differentiated among themselves? What are the principal sources? What nutritional value do they have? What issues of intake exist?

(16 marks)

(b) Briefly outline the principles of the method of analysis for fatty acids.

(4 marks)

7 For **five** of the following, comment on the microbiological problems that may arise in the following foods, and the physical or chemical controls or treatments that may be employed to counter them.

(a) Fruit preserve

(b) Modified atmosphere packed cooked meat

(c) Soft Drink

(d) Canned mushrooms

(e) Hazelnut yoghurt

(f) Ground Coriander

(4 marks each, total 20 marks)

8 (a) Outline the main requirements of the Infant Formula and Follow-on Formula (England) Regulations 2007 (or the equivalent Regulations for Scotland or Wales) with respect to contaminants.

(10 marks)

(b) For **two** such contaminants, discuss the particular challenges for their analysis in an infant formula.

(10 marks)