Mastership in Chemical Analysis

Part B Examination

Paper 2

Online

Thursday 13th October 2022

1000 - 1400
Instructions

You must answer **two** out of the four questions from section 1 and answer **both** questions from section 2. **Four** questions in total.

The answers to each question must be returned in the examination envelope provided at the end of the examination.

This is an open book examination, and you are allowed access to any resources you feel are appropriate. This includes the use of the internet; however, you are not allowed to communicate with any third parties during the examination.

Where appropriate, please reference the appropriate resources used for each question.

The marks allocated to each question are given.

Unless otherwise stated, references to Statutes in England include the equivalent alternatives for Scotland, Wales and Northern Ireland.

Unless otherwise stated, any reference to Statutes includes the EU regulations that they enforce.

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**Food (Section 1)**

1. (a) Discuss the occurrence of acrylamide in food and the measures in place to control it. Include in your answer the role of Food Business Operators and Local Authority enforcement officers in this control and in your view how this would work in practice.

   (12.5 marks)

(b) Describe the legislative framework in place for ensuring the safety of food contact materials. Bearing in mind increasing consumer demand for sustainable packaging, how could new food contact materials be assessed as safe to use?

   (12.5 marks)
2. For the following scenarios state the microbiological examination that would be carried out to determine whether the sample complies with the relevant legislation and/or guidelines. In your answer provide the statutory method(s) and the criteria that would have to be satisfied for compliance purposes.

(a) A sample of unsalted butter made from raw milk has been submitted to the lab for testing. The sample was taken from a local farm shop before sale.

(7 marks)

(b) A sample of Beef Tartare made with lemon juice and herbs, where the product is placed on the market during its shelf-life.

(5 marks)

(c) Spicy tuna sushi roll containing uncooked tuna in a spicy chilli sauce covered in a nori sheet with sushi rice, sampled before the food has left the Food Business Operator.

(3 marks)

(d) Mascarpone cheese made using pasteurised milk, sampled before the food has left the Food Business Operators

(7 marks)

(e) Premium raw chicken burger made from minced chicken and herbs, sampled from a local butcher; product placed on market during its shelf-life.

(3 marks)

3. An Environmental Health Officer (EHO) has contacted you with regard to an outbreak which has been linked to a food producer in their area. So far, there have been three cases in Scotland and eight cases in England of *Listeria monocytogenes* identified. UK Health Security Agency and Public Health Scotland surveillance teams have identified the same strain of *L. mono* using whole genome sequencing; this has linked the outbreak to smoked salmon products from a Food Business Operator (FBO).

The EHO will be leading an investigation at the FBO and would like some advice with regard to how the investigation should be focussed.

Discuss the various factors that you would be advising the officer to look at, including any testing that you would recommend and how you would interpret the results.

(25 marks)
4. As part of the harmonisation of food labelling legislation in the European Union, a new approach to food labelling was adopted. The change was effectively a move from 'recipe' law to 'informative labelling'. Rather than prescribing the composition of food, food businesses were given more freedom to make food with differing composition on the basis that the consumer would have more choice and would be able to tell what was in the food by reading the label.

Using examples of different types of foods, discuss the advantages and disadvantages of these changes and give an opinion on whether the consumer is better or worse off as a result.

(25 marks)

Agriculture (Section 2)

5. A Trading Standards Officer newly appointed to an Animal Feed post at a local authority is asking for your help as the appointed Agricultural Analyst.

The officer would like to obtain a full understanding of all the variables of a sampling process in order to be able to write a protocol (for fellow officers) to ensure that the results of analysis on all formal feed samples taken by the local authority will stand up in court.

Generate a document explaining to the officer all of the necessary components that you think must be considered to achieve this and your rationale for being effective, including pitfalls which must be addressed. Also include in your document any recommended sources that the officer may reference for extra information.

(25 marks)

6. A liquid 7:7:7 NPK fertiliser is submitted for testing by Trading Standards on behalf of a local manufacturer on an annual basis. Although the P and K values by analysis agree with the values declared in the statutory statement, the N value always comes out below the declared amount. The manufacturer is insistent that the statutory statement is correct.

Discuss the possible causes of the low nitrogen result, focussing on the way liquid fertilisers are manufactured, stored and used, how the sample for analysis should be taken, and the relative merits of the official methods for the detection of nitrogen in fertilisers when applied to this product.

(25 marks)

END OF PAPER

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