

UNIVERSITY OF KWAZULU-NATAL
SCHOOL OF AGRICULTURAL, EARTH & ENVIRONMENTAL SCIENCES
DISCIPLINE OF DIETETICS AND HUMAN NUTRITION
MAIN EXAMINATION: JUNE 2015
SUBJECT, COURSE & CODE: FURTHER CONCEPTS IN FOOD SCIENCE
(FSCI 210)

DURATION: 3 HOURS

TOTAL MARKS: 120

External Examiner:

Dr A. van Onselen

Internal Examiner:

Dr M. Siwela

NOTE: THIS PAPER CONSISTS OF FIVE (5) PAGES, PLEASE SEE THAT YOU HAVE THEM ALL.

INSTRUCTIONS

1. Section A is compulsory. This section carries 20 marks.
2. There are six (6) questions in Section B; each question carries 25 marks. Answer any four (4) questions in Section B.
3. Use clearly labeled diagrams where necessary.

SECTION A is COMPULSORY and there is a choice from SECTION B

SECTION A is COMPULSORY

QUESTION 1

- 1.1 Name one (1) type of substances found in the out layers of a brown common bean which may be health promoting. (1)
- 1.2 Some type of substances found in the outer layer of a brown common bean may have a negative effect on the nutritional value of the bean. State the negative nutritional effect and one (1) nutrient likely affected. (2)
- 1.3 State two (2) physical changes that can be easily observed as a sign that bananas have ripened. (2)
- 1.4 (a) Why does fish liver oil easily become rancid? (2)
- 1.4 (b) Name the compound responsible for the bright red colour in fresh meat and state the reaction that results in the production of the compound named. (2)
- 1.5 (a) Name one (1) divalent mineral nutrient found in beef liver oil which is also present in spinach. (1)
- 1.5 (b) Why would you recommend the consumer to obtain the mineral named in 1.5 from fish rather than spinach? (2)
- 1.6 What is the substance responsible for the red colour of tomatoes (1)
- 1.7 State one (1) objective of blending (mixing) different types of coffee. (1)

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- 1.8 What will be the colour of juice obtained from red grapes when diluted with acidic water? (1)
- 1.9 Name one (1) toxic substance or type of substances that imparts a bitter flavour to plant food. (1)
- 1.10 Overall, what does a triangle and hedonic tests determine, separately? (2)
- 1.11 In which order would you process spinach: Wash and cut or Cut and wash? Why? (2)
- [20]**

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SECTION B

ANSWER FOUR (4) QUESTIONS FROM THIS SECTION

QUESTION 2

2.1 Name six (6) commercial milk products, **excluding** pasteurized and sterilized or UHT milk. Describe briefly how each of the named products is produced. (18)

2.2 Explain two (2) methods of coagulating fresh milk to produce cottage cheese. For each of the methods, what condition/s do you consider critical for coagulation to occur? (6)

2.3 State one (1) advantage of preserving milk by sterilization compared to preserving by freezing. (1)
[25]

QUESTION 3

3.1 State three (3) factors that affect the texture of meat and explain briefly the effect of each of these factors on meat texture. (6)

3.2. 1 Identify two (2) factors that preserve a smoked Viena sausage. (2)

3.2.2 State the chemical nature of the myoglobin molecule (including the oxidation state of iron (Fe) in haem part of the molecule) for each of the following myoglobin forms: **Oxymyoglobin; Metmyoglobin; Nitrosomyoglobin; and Globin hemichrome**. State also the conditions that promote the production of each of the forms of myoglobin named above. (12)

3.2.3. State the colour of the meat when myoglobin is in each of the following forms: Oxymyoglobin; Metmyoglobin; Nitrosomyoglobin; Globin hemichrome. (4)

3.3 Give one (1) reason for advising consumers to minimize consuming offal. (1)

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QUESTION 4

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4.1. Outline the general chemical composition of leafy vegetables and hence evaluate their nutritional and health-promoting value. (10)

4.2.1 State three (3) factors that determine the choice of a food preservation method/technique. (3)

4.2.2 Describe and discuss two (2) methods you would use to maintain the desirable quality of vegetables for more than one month. Include examples, as well as advantages and disadvantages of these methods. (12)

[25]

QUESTION 5

5.1 Outline the contents of a talk you will give to a group of people who wish to know about fish handling, preservation and storage.

The speech should include:

- an outline of the processing/handling steps applied to fish when they have been caught from the water and have been brought onto a ship which has processing facilities
- explain the possible deterioration processes that may occur in the fish
- explain the different preservation and storage options that may be applied to fish. (20)

5.2 Write the main points you would use to argue that chicken meat is nutritionally better than red meat (e.g. beef). (5)

[25]

QUESTION 6

6.1 Write the main points you would use to argue that the scientific sensory evaluation of food is necessary in the disciplines of Food Science and Technology; Dietetics; and Human Nutrition. (5)

6.2 By means of a figure/diagram or otherwise, classify the test methods used in the sensory evaluation of food. (12)

6.3 You have developed a sugar-free drink by replacing sucrose with a sweetener. You would like to find out whether consumers will detect a difference in taste between the new drink and the standard (conventional one). Give an outline of a sensory evaluation experiment you will perform to find out whether the consumer will detect the difference in taste between the two drinks. In your answer, name the sensory test to be used, number of panelists and whether they will be trained or not, how the two samples will be presented, and how (including statistical methods used) the results will be analysed. (8)

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QUESTION 7

7.1 Name the substances that are largely responsible for the flavour and colour of black tea. (3)

7.2.1 Name one (1) flavour substance that is absent in herbal teas but is found in the traditional (usual) teas. (1)

7.2.2 What substances with potential health benefits are found in herbal teas? (1)

7.3.1 Explain, briefly, the attractive characteristics of the soya bean as a food. (4)

7.3.2 Name three (3) soya products in the market. (3)

7.4 Describe how you would assess the stability of egg white foam made from egg whites after adding a foam stabilizer of your choice. Include a control. Explain how the results will be interpreted. (8)

7.5 State how you would either prevent or correct the following food quality problems:

7.5.1 Flakes in a stirred egg custard; (2)

7.5.2 "Weeping/leakage" in a soft meringue filled with pudding; (2)

7.5.3 "Beads" on a soft meringue. (1)

[25]