

UNIVERSITY OF KWAZULU-NATAL
SCHOOL OF AGRICULTURAL, EARTH & ENVIRONMENTAL SCIENCES
DISCIPLINE OF DIETETICS AND HUMAN NUTRITION
EXAMINATION: JUNE 2013
SUBJECT, COURSE & CODE: FURTHER CONCEPTS IN FOOD SCIENCE
(FSCI 210)

DURATION: 3 HOURS

TOTAL MARKS: 120

External Examiner:

Mrs 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 the common bean which can reduce the bioavailability of minerals and proteins. (1)
- 1.2 The substances named in 1.1 are potentially health-promoting. State the chemical properties of these substances that make them potentially health-promoting. (1)
- 1.3 State two (2) chemical changes that occur in ripening bananas. (2)
- 1.4 (a) Given that the mixing ratio of fruit extract to sugar is 4:3 (w/w), calculate the weight of fruit extract that should be used if 600 g of sugar is to be added. Show calculations. (3)
- 1.4 (b) Name the compound responsible for the bright red colour in fresh meat and state the reaction that results in the compound named. (2)
- 1.5 Name one (1) micronutrient found in fish liver oil which is also present in spinach. (1)
- 1.6 Why would you recommend the consumer to obtain the micronutrient named in 1.5 from fish rather than spinach? (2)

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- 1.7 What food product would you use to replace eggs in a menu in which the customer wants an egg flavour but does not eat eggs? (1)
- 1.8 State one (1) objective of blending (mixing) different types of coffee. (1)
- 1.9 What is the colour of anthocyanins in an alkaline solution? (1)
- 1.10 Name one (1) toxic substance or type of substance that imparts a bitter flavour to plant food. (1)
- 1.11 Overall, what do a triangle and hedonic tests determine, separately? (2)
- 1.12 In which order would you process spinach: Wash and cut or Cut and wash? Why? (2)

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SECTION B

ANSWER FOUR (4) QUESTIONS FROM THIS SECTION

QUESTION 2

- 2.1 (a) Give a short description of the chemical composition and structure of caseins, the colloidal milk proteins. (6)
- (b) Give two (2) food uses of whey powder. (2)
- 2.2 Explain two (2) methods by which you would coagulate milk to produce cottage cheese. For each of the methods, what condition/s do you consider critical for coagulation to occur? (8)
- 2.3 (a) State one (1) type of milk that can be used to produce a foam of a large volume and state three substances that can be added to stabilise the foam. (4)
- 2.3 (b) Explain the physical changes that occur on the surface of the milk resulting in film formation when milk is heated in an open container, and state how you would prevent the formation of the film. (5)

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QUESTION 3

3.1 (a) State four (4) factors that can contribute to the tough texture of meat and explain briefly how each of these factors can contribute to the tough texture. (8)

3.1 (b) Identify two (2) factors that preserve a smoked Viena sausage. (2)

3.2 (a) Outline the processes that lead to meat becoming tough some 10-12 hours after the animal has been slaughtered. (12)

3.2 (b) State three methods you would use to tenderize the meat, which has undergone the processes outlined in 3.2a. (3)

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QUESTION 4

4.1 Describe and discuss three (3) 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. (15)

4.2 Explain the effects (and the mechanisms for these effects) of heat, cooking water and added sugar on the tenderness of dried fruits. (6)

4.3 (a) Name and state any one (1) characteristic of each of two (2) types of fruit/vegetable pigments. (2)

(b) For each of the pigments named in 4.4a, state one (1) condition you would avoid in order to prevent loss of the desirable colour of the pigment. (2)

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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.

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5.2 Write the main points you would use to argue that chicken is a good food source. The points should cover only the nutritional and sensory properties of chicken meat. (5)

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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)

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7.5.2 When baked in the casserole dish, the egg custard tends to coagulate; (2)

7.5.3 Fruit jelly does not set after cooking and standing to cool. (1)

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