



MERU UNIVERSITY COLLEGE OF SCIENCE & TECHNOLOGY

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University Examinations 2012/2013

SECOND YEAR, SECOND SEMESTER EXAMINATION FOR DEGREE OF BACHELOR OF
SCIENCE IN FOOD SCIENCE AND TECHNOLOGY

AFS 2209: FOOD CHEMISTRY 11

DATE: DECEMBER 2012

TIME: 2 HOURS

INSTRUCTIONS: Answer question *ONE* and any other *TWO* questions

QUESTION ONE – 30 MARKS

- (a) Due to rising obesity concerns an ice cream manufacturer is witnessing a decline in sales. Their new product development manager approaches you for advice on how they could formulate a low calorie ice cream while retaining the organoleptic properties. Summarize your recommendations. (6Marks)
- (b) Characterize the loss of green colour in thermally processed vegetables. (5Marks)
- (c) Outline the four basic tastes and give examples of compounds eliciting the relevant sensations. (4Marks)
- (d) State two regulatory frameworks in Kenya that control the use of food additives. (2Marks)
- (e) Name three flavour enhancers applied commercially in foods. (3Marks)
- (f) Outline the generalized protective mechanisms of phytochemicals in the human body. (4Marks)
- (g) Why is it necessary to use exogenous amylases at the mashing step in brewing rather than rely on endogenous enzymes derived from malting barley? (3Marks)
- (h) Explain why rapid creaming of cold milk is a deviation from stroke's sedimentation velocity equation. (3Marks)

QUESTION TWO – 20 MARKS

- (a) A local bakery is experiencing poor overall quality of their 400grams sliced bread. Based on your knowledge in application of exogenous enzymes, explain how they could use carbohydrate, lipid and protein transforming enzymes to yield a better product. (12Marks)
- (b) A fruits salads packer has been requested to incorporate cut apple cubes into a product which had strawberry, mango and sweet melon in its original recipe. However, the new ingredient turns

brown within a few hours after packing. The client does not want to final product to change significantly in taste. Advice the packer on strategies that could control the defect and explain why each approach would be effective. (6Marks)

(c) Why are salts of acetic acid preferentially used as preservatives in bread? (2Marks)

QUESTION THREE – 20 MARKS

(a) Discuss five functions of organic and inorganic acids in foods systems. (10Marks)

(b) Describe the characteristic colours exhibited by Betalains and their stability during processing. (10Marks)

QUESTION FOUR – 20 MARKS

(a) Explain why beers flavoured with natural hops are packaged in amber bottles instead of clear ones. (5Marks)

(b) Discuss the use of Sulphur Dioxide and Sulphites as food additives. (6Marks)

(c) Describe how Phospholipase A₂ aids in the degumming stage during oil processing. (3Marks)

(d) Discuss the use of Acesulfame K as a sweetener in food systems. (6Marks)

QUESTION FIVE – 20 MARKS

(a) Briefly discuss five types of physical instability that can occur in oil-in water emulsions. (10Marks)

(b) Discuss three reasons that make it difficult to predict the total effects of phytochemicals in the body. (6Marks)

(c) Yoghurt and “Mala” are fermented milk products with distinctively different flavours. Explain why. (4Marks)