



FACULTY	AGRICULTURE, ENGINEERING AND NATURAL SCIENCES		
SCHOOL	AGRICULTURE AND FISHERIES SCIENCES		
DEPARTMENT	FOOD SCIENCE AND SYSTEMS		
SUBJECT	DAIRY SCIENCE AND TECHNOLOGY		
SUBJECT CODE	AFST 3881		
DATE	JUNE 2025		
DURATION	3 HOURS	MARKS	100

FIRST OPPORTUNITY EXAMINATION

Examiner: **Ms M.J. Kandjou**

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This question paper consists of **two (2)** pages excluding the front page

Instructions

- **Answer all five (5) questions**
- **Calculators are allowed**

QUESTION 1

- a) Describe the process of milk synthesis in dairy cows, including the hormonal regulation involved. [9]
- b) Explain any three (3) significant factors that affect the quality of raw milk at the farm level. [6]
- c) Outline the significance of key quality control tests performed on raw milk before processing. [5]

QUESTION 2

- a) Write short notes on the following:
 - i) Anti-microbial systems in raw milk [5]
 - ii) Effects of antibiotics residues in raw milk [5]
- b) Outline the three physical states of the milk constituents, with specific examples for each state. [3]
- c) Discuss the composition and structure of milk proteins in detail. [7]

QUESTION 3

- a) Compare and contrast the process of pasteurization, sterilization and UHT treatment and the impact on milk composition. [8]
- b) Explain the significance of homogenization in milk processing and its impact on the sensory and physical properties of milk. [4]
- c) Describe the key steps involved in the processing of:
 - i) Cheese, including the role of the major ingredients used. [6]
 - ii) Butter, emphasizing the phase inversion process. [5]

QUESTION 4

- a) Identify and describe the effect of any three (3) major spoilage microorganisms in milk. [7]
- b) Discuss the relationship between the *Lactobacillus bulgaricus* and *Streptococcus thermophilus* in yoghurt. [5]
- c) Describe the CIP method as applied in a dairy processing facility. [5]
- c) Explain the different methods and principle of cream separation. [3]

QUESTION 5

- a) Given 1000 kg of milk testing 5.4% fat. What will be the yield of cream of 45% and 62% fat? [5]
- b) Calculate the required fat content to standardize 500 kg of whole milk 3.8% fat to produce skim milk 0.1% fat and cream 40% fat. Show all calculations. [5]
- c) A batch of ice cream weighing 100 kg before freezing results in 150 kg after freezing. Calculate the overrun percentage and interpret its significance. [5]

END OF EXAMINATION