UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

B.Sc. ENVIRONMENTAL HEALTH AND FOOD SCIENCE

SEMESTER II

EXAM

MAY 2019

TITLE OF PAPER: PRINCIPLES OF DAIRY PROCESSING

COURSE CODE: EHS346

DURATION: 2 HOURS

INSTRUCTIONS:

1. READ THE QUESTIONS CAREFULLY.
2. ANSWER **ANY 4 QUESTIONS.**
3. EACH QUESTION CARRIES 25 MARKS. WHERE A QUESTION IS SUBDIVIDED INTO PARTS, THE MARK FOR EACH PART IS SHOWN IN BRACKETS.
4. NO PAPER SHOULD BE BROUGHT INTO THE EXAMINATION ROOM.
5. WRITE NEATLY AND CLEARLY
6. BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER.

SPECIAL REQUIREMENTS: NONE

DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS GRANTED BY THE INVIGILATOR.

QUESTION ONE

a. Discuss the factors that influence the variability of the composition of milk. [12 marks]

b. What is the technological role of alkaline phosphatase in milk? [5 marks]

c. Explain how the peroxidase system in milk works and why it is important for small scale dairy farmers. [8 marks]

[TOTAL: 25 MARKS]

QUESTION TWO

a) Explain why evaporation of milk is often done under reduced pressure. [3 marks]

b) Concentration and evaporation of milk can affect growth of microorganisms in milk. Explain why this is so. [4 marks]

c) What is the purpose of atomisation during spray drying? [3 marks]

d) Use a labelled diagram to illustrate the process of spray drying of milk. [15 marks]

[TOTAL: 25 marks]

QUESTION THREE

a) Distinguish between set yogurt and stirred yogurt, highlighting the differences in the processing steps. [10 marks]

b) Distinguish the characteristics of "low pasteurisation" and "high pasteurisation" milk products. [15 marks]

[TOTAL: 25 marks]

QUESTION FOUR

The casein micelle structure is the model used to describe some of the properties of milk under different conditions. Briefly discuss the following aspects related to the micelle structure:

a) The role of kappa-casein in stabilising the micelle. [5 marks]

b) The role of colloidal calcium phosphate. [5 marks]

c) The effect of pH on the micelle structure. [8 marks]

d) The effect of heat on casein. [7 marks]

[TOTAL: 25 marks]

QUESTION FIVE

a) Define a bacteriophage. [2 marks]

b) Describe the two ways phages multiply in the host cell. [10 marks]

c) Discuss the impact of phages on the dairy industry. [7 marks]

d) The layout of a cheese plant with respect to the various process areas is critical to avoid phage infections during cheese manufacture. Which **two** areas in a cheese plant must be physically separated from each other to achieve this objective? [6 marks]

[TOTAL: 25 marks]

END OF QUESTION PAPER