**2008/2009**

# UNIVERSITY OF SWAZILAND

## FINAL EXAMINATION PAPER

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| **PROGRAMME:** | **B. Sc. ANIMAL SCIENCE IV AND B.Sc. AGRICULTURAL EDUCATION IV** |
| **COURSE CODE:** | **APH 404** |
| **TITLE OF PAPER:** | **DAIRY TECHNOLOGY** |
| **TIME ALLOWED:** | **TWO (2) HOURS** |
| **INSTRUCTIONS:** | **ANSWER ANY 4 QUESTIONS.** |

**THIS PAPER MAY NOT BE OPENED UNTIL THE CHIEF INVIGILATOR HAS GRANTED PERMISSION.**

**QUESTION 1**

a) Briefly describe the possible sources of antibiotic residues in consumer milk and explain three reasons why consumer milk must be free of antibiotics. (8 Marks)

b) Describe and illustrate the synthesis of lactose and illustrate the two anomers of lactose organic compounds. (17 Marks)

**QUESTION 2**

Discuss the technology of butter making. (25 Marks)

**QUESTION 3**

a) Illustrate and describe the pathway for the origin of milk triacylglyceride. (10 Marks)

b) Describe and illustrate the structure of the milk fat globule. (15 Marks)

**QUESTION 4**

Briefly describe the following organisms and their significance in dairy technology:

a) *Lactobacillus delbruickii* ssp. *Bulgaricus* and *Streptococcus salivarius* ssp *thermophilus* (7 Marks)

b) *Saccharomyses cerevicie* and *Torula* sp (6 Marks)

c) *Escherichia coli* and *Salmonella entiritidis* (6 Marks)

d) *Xanthomonas campestris* and *Klebsiella oxytoca* (5 Marks)

**QUESTION 5**

a) If the titratable acidity of raw milk was 0.24 % what will be your conclusion about that milk and why? (6 Marks)

b) Briefly discuss continuous flow pasteurization system and the merit regeneration in this systems. (12 Marks)

c) Given: That incoming milk is 6°C; Pasteurized milk is 75°C; regeneration rate is 90%; Calculate:

(i) What temperature will incoming milk be raised to by regeneration? (4 Marks)

(ii) What temperature will pasteurized milk be cooled to by regeneration ? (3 Marks)