UNIVERSITY OF SWAZILAND
Faculty of Health Sciences

DIPLOMA IN ENVIRONMENTAL HEALTH

FINAL EXAMINATION PAPER 2006

TITLE OF PAPER	:	FOOD SAFETY & HYGIENE
COURSE CODE	:	EHS 301
DURATION	:	3 HOURS
MARKS	:	100
INSTRUCTIONS	:	ANSWER ONLY FIVE QUESTIONS.
	:	QUESTION ONE IS COMPULSORY
	:	EACH QUESTION CARRY 20 MARKS.
	:	NO QUESTION PAPER SHOULD BE BROUGHT INTO NOR OUT OF THE EXAMINATION ROOM.
	:	BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER.

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

Question 1

Multiple choice questions
Choose the most appropriate answer.

1. Factors that cause inhibition and death of bacteria in carbonated beverages are:
   A. carbon dioxide and benzoate
   B. benzoate and low pH
   C. water activity and sugar content
   D. reduced oxidation-reduction potential and water activity
   E. low pH and water activity

2. Potassium sorbate is added in Emahhewu as a preservative in order to control:
   A. Microorganisms
   B. Bacteria
   C. Molds
   D. Lactic acid bacteria
   E. Sourness

3. Spoilage of jams that is characterized by gas bubbles is probably caused by;
   A. Clostridium perfringens
   B. Fermentative yeasts
   C. Micrococci
   D. Molds
   E. Salt-tolerant coliforms

4. Avidin and lysozyme are intrinsic antimicrobial substances that are found in:
   A. egg
   B. sour milk
   C. garlic
   D. meat
   E. fresh milk

5. Roppiness in bread is commonly caused by the following;
   A. Bacillus cereus
   B. Bacillus brevis
   C. Bacillus licheniformis
   D. Clostridium perfrigens
   E. Clostridium botulinum

6. Molds are often specific in the attack on fruits and vegetables: Which mold commonly attack bananas;
   A. Botrytis
   B. Macropoma musae
   C. Alternaria citri
   D. Phomopsis vexans
   E. Diplodia sp.

7. Which fruit is commonly attacked by Diplodia species of mold;
   A. chillies
   B. grapes
   C. banana
   D. melons
   E. lime

8. Excessive carbon dioxide concentration in the preservation of pears and apples may result in a condition known as;
   A. Black heart
   B. Brown heart
   C. Maillard reaction
   D. Enzymatic browning
   E. Phenolase

9. Gray mold rot in onions is caused by which mold;
   A. Macropoma musae
   B. Phomopsis vexans
   C. Geotrichum candidum
   D. Botrytis cinerea
   E. Colletotrichum coccodes

10. Enzymatic browning in bruised fruits and vegetables is caused by;
   A. Phenolase
   B. Pectolytic
   C. Brown mold
   D. Peroxidase
   E. Anthracnose

11. Bacterial soft rot in fruits and vegetables is commonly caused by;
   A. Erwinia carotova
   B. Alternaria tenuis
   C. Colletotrichum musae
   D. *Macropoma musae*
   E. Sclerotinia sclerotiorum

12. The aim of milk pasteurization in Swaziland is to destroy;
    A. Coxiella bunetti
    B. Listeria monocytogenes
    C. Mycobacterium avium
    D. Mycobacterium tuberculosis
    E. Mycobacterium bovis

13. The major disadvantage of ionizing radiation of foods is that:
    A. foods cannot be irradiated in the frozen state
    B. considerable heat is produced
    C. enzymes in foods are not inactivated
    D. residues of non food material are produced
    E. mutagenic, teratogenic, carcinogenic and toxic factors are induced in foods.

14. Very high intensity radiation with great penetrating power produced during decay of cobalt-60 is:
    A. UV radiation
    B. X radiation
    C. α radiation
    D. β radiation
    E. γ radiation

15. The primary cause of lethality of microorganisms exposed to ionizing irradiation is:
    A. Change in proteins
    B. Damage to membranes
    C. Damage to microbial DNA
    D. Enzymes inactivation
    E. Formation of cytoplasmic toxins

16. Which of these pathogens would most likely grow and multiply in salted meat that has a water activity within the range of 0.93 – 0.85?
    A. *Bacillus cereus*
    B. *Clostridium perfringens*
    C. *Salmonella enteritidis*
    D. *Salmonella typhi*
    E. *Staphylococcus aureus*

17. Which of these chemical compounds is commonly used as a mold inhibitor in bread and other bakery products:
    A. Benzoic acid
    B. Sorbic acid
    C. p-hydroxybenzoic acid (parabens)
    D. sodium diacetate
    E. formaldehyde

18. Based on the pH alone which organic acid would you choose to preserve a food that has a pH of 6?
    A. acetic acid
    B. citric acid
    C. p-hydroxybenzoic acid (parabens)
    D. lactic acid
    E. sorbic acid

19. Which of the following are most susceptible to injury at temperatures below 5^0C?
    A. bacterial spores
    B. gram-positive cocci
    C. gram-positive rods
    D. gram-negative rods
    E. bacterial toxins

20. Which of these microorganisms has been reported to grow at temperatures lower than $-2\ ^0$C
    A. Clostridium botulinum type E
    B. Cladosporium herbarum
    C. Compylobacter jejuni
    D. Staphylococcus aureus
    E. Vibrio parahaemolyticus

Question 2

Write short notes on the following;

a.	Ultra Heat Temperature (UHT) milk.	[4]
b.	Milk pasteurization	[5]
c.	Maillard reaction	[3]
d.	Nisin	[4]
e.	Nitrates	[4]
		[20 Marks]

Question 3

a. Some milk containers are labeled homogenized.
What does that mean?
Why milk has to undergo such a process ?
[4]

b) Parmalet of Swaziland has a mandate to produce wholesome milk for their Swaziland customers. You are therefore required to formulate objectives which will assist the company to achieve their mandate. [4]

c. How would Parmalet attain the objectives you have formulated above in (b)?
[12]

[20 Marks]

Question 4

a. Rye-bread is good for people who are dieting or slimming
How is that achieved? [4]

b. You bought a loaf of bread from the supermarket and during slicing you observe string-like structures.
What is the cause of this condition? [2]

c. Spar supermarket sells hot bread either packaged in plastic bag or unpackaged.
Is there any health associated problem by doing such (explain your answer)
[3]

d. Factory A is canning oranges and tomatoes whereas Factory B is canning green beans.
Which factory will have a botulinum cook and why would that be so? [5]

e. Explain three (3) conditions that are likely to cause microbial spoilage in canned foods. [6]

[20 Marks]

Question 5

a. Salmonellosis is significantly associated with poultry meat and eggs.
Why is that so?
[5]

b. The health, diet, age, and the environment of hens play a major role in the quality of eggs.
Explain this. [15]

[20 Marks]