



UNIVERSITY OF SWAZILAND
Faculty of Health Sciences

DIPLOMA IN ENVIRONMENTAL HEALTH
FINAL EXAMINATION PAPER 2007

- TITLE OF PAPER** : FOOD SAFETY & HYGIENE
- COURSE CODE** : EHS 301
- DURATION** : 3 HOURS
- MARKS** : 100
- INSTRUCTIONS** :
- : READ THE QUESTIONS & INSTRUCTIONS CAREFULLY
 - : ANSWER ALL FIVE (5) QUESTIONS
 - : EACH QUESTION CARRIES 20 MARKS.
 - : WRITE NEATLY & CLEARLY
 - : NO 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.

64

Question One

Multiple choice questions

Choose the most appropriate answer.

1. Which one of these groups is used to decontaminate eggs surfaces:
 - A. Carbon monoxide
 - B. Ethylene oxide
 - C. Formaldehyde
 - D. Methyl bromide
 - E. Sulfur dioxide

2. 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

3. Egg white spoilage would most likely be caused by which of these classes of microbes:
 - A. gram-positive cocci
 - B. gram-positive rods
 - C. gram-negative rods
 - D. molds
 - E. yeasts

4. Mayonnaise is not likely to be spoiled by which one of these microorganisms or classes of microorganisms listed:
 - A. flat sour microorganisms
 - B. micrococci & staphylococci
 - C. saccharomyces
 - D. *Bacillus cereus*
 - E. yeasts

5. Which one of these statements is not true
In bread yeast fermentation;
 - A. Sugar is added to increase yeast activity
 - B. Too high concentration of sugar has a deleterious osmotic effect on yeast cells
 - C. The addition of salt has the same effect as excess sugar
 - D. Yeast activity depends on temperature of the dough
 - E. Yeast fermentation produce alcohol and hydrogen gas

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. Enzymatic browning in bruised fruits and vegetables is caused by;
- A. Peroxidase
 - B. Pectolytic
 - C. Brown mold
 - D. Phenolase
 - E. Anthracnose
9. 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*
10. Which group of artificial sugars are added in tab soft drinks in Swaziland;
- A. Sodium cyclamate & saccharin
 - B. Sodium benzoate and acesulfame-k
 - C. Acesulfame-k & sodium cyclamate
 - D. Aspartame & nutrasweet
 - E. Saccharin & aspartame
11. Which starter cultures are used in the manufacture of yogurt;
- A. *Streptococcus thermophilus* only
 - B. *Lactobacillus bulgaricus* only
 - C. *Streptococcus thermophilus* & *Lactobacillus bulgaricus*
 - D. *Streptococcus thermophilus* & *Leuctococcus lactis*
 - E. *Lactobacillus bulgaricus* & *Leuctococcus lactis*

12. Which starter cultures are used in the manufacture of cheddar cheese;
- A. *Lactococcus cremoris* & *Lactococcus lactis*
 - B. *Lactococcus cremoris* & *Propionibacterium shermanii*
 - C. *Lactococcus lactis* & *Propionibacterium shermanii*
 - D. *Lactococcus lactis* & *Leuconostoc citrovorum*
 - E. *Streptococcus thermophilus* & *Lactobacillus bulgaricus*
13. Which of the following microorganism is most susceptible to injury at low temperature
- A. Bacterial spores
 - B. Gram-positive cocci
 - C. Mold toxins
 - D. Gram-negative rods
 - E. Bacterial toxins
14. Which of these pathogens would most likely contaminate sea foods
- A. *Bacillus cereus*
 - B. *Staphylococcus aureus*
 - C. *Listeria monocytogenes*
 - D. *Aeromonas hydrophila*
 - E. *Clostridium perfringens*
15. In which food product would you most likely find AFM1 toxins
- A. Cereal products
 - B. Legumes
 - C. Peanut butter
 - D. Peanuts
 - E. Meat
16. In which food product would you most likely find AFB1 toxins
- A. Cereal products
 - B. Legumes
 - C. Peanut butter
 - D. Peanuts
 - E. Meat
17. If a person consume aflatoxins with food products, there will be a.
- A. Kidney damage
 - B. Hallucination
 - C. Liver damage
 - D. Heart damage
 - E. Lung damage

18. Which of the following statements is not correct?
- A. Low temperature is inhibitive to the growth, even causing death to some microbes
 - B. In salmonella classification is based on somatic (O), flagellar (H), and capsular (K) antigenic profiles
 - C. In *Clostridium perfringens*, both spores and toxins may be found in human faeces
 - D. *Clostridium perfringens* spores are activated and will germinate at 70 – 80 °C
 - E. If an animal is slaughtered while stressed, *Clostridium botulinum* can become systemic
19. *E.coli* 0157:H7, will cause symptoms that include,
- A. Watery diarrhea with rice water stools
 - B. Watery diarrhea with blood and mucus in stools
 - C. Watery diarrhea and all blood stools
 - D. Watery diarrhea with mucus but no gross blood
 - E. Double or blurred vision
20. Which of these statements is correct?
- A. Like shigella, *Enteroinvasive E.coli* produces stable toxins
 - B. *Enterotoxigenic E.coli* pathogenicity mechanism is similar to V.cholera
 - C. *Compylobacter jejuni* is strictly psychrophilic and will grow in the refrigerator
 - D. *Yersinia enterocolitica* is strictly microaerophilic and poultry is the major source
 - E. *Clostridium botulinum* group 1 strains will grow at 3.3° C to 45 and group 11 strains at 10 to 50° C

[Total Marks 20]

Question Two

Write short notes on the following;

- a. Starter cultures in milk fermented products. [5]
- b. Addition of chemicals in food preservation. [5]
- c. Mold food spoilage. [5]
- d. Ultraviolet food irradiation [5]

[Total Marks 20]

Question Three

There are two ways in which canned or bottled food stuffs may be spoiled, it is either microbiologically or chemically. Explain the two methods of caned food spoilage.

- a. microbial spoilage [10]
- b. chemically spoilage [10]

[Total Marks 20]

Question Four

a. Equal numbers of bacteria placed in physiological saline or nutrient broth at the same pH are not destroyed with the same ease by heat. Briefly describe the following factors or parameters of microorganisms and their environments (factors which influence the heat resistance of microorganisms).

- i. Water [3]
- ii. Fat [3]
- iii. Acidity [4]
- iv. Salt [3]

b. Discuss the role played by enzymes in the spoilage of foods. [7]
[Total marks 20]

Question Five

a. Salmonellosis is significantly associated with poultry meat and eggs. Why is this so? [6]

b. Environmental factors play a major role in the quality of eggs. How does this happen? [8]

c. How does low temperature influence the type of microorganisms in food? [6]

[Total marks 20]