



UNIVERSITY OF SWAZILAND
Faculty of Health Sciences

DIPLOMA IN ENVIRONMENTAL HEALTH
SUPPLEMENTARY EXAMINATION PAPER 2005

TITLE OF PAPER : FOOD SAFETY & TECHNOLOGY

COURSE CODE : EHS 301

DURATION : 3 HOURS

MARKS : 100

INSTRUCTIONS :

- : ANSWER ALL FIVE QUESTIONS
- : EACH QUESTION CARRY 20 MARKS.
- : 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.

Question 1

Multiple Choice Questions (Choose the Best Answer)

1. The time required to destroy 90% of a population of microbes at a specific temperature is known as the;
A C value
B D value
C F value
D Z value

2. Blanching vegetables has several useful applications in food processing but it does not:
A Destroy spores of most bacteria
B Remove colors of vegetables
C Inactivate enzymes
D Kill most molds and yeasts

3. Nitrates and nitrites (NaNO_3 , NaNO_2) are added in meat products, such as sausages, as preservative to:
A Stop the germination of *Clostridium botulinum* spores
B Kill *Clostridium botulinum* spores
C Improve the color of sausages and contributes to flavor
D Answer A and C

4. ----- are generally more sensitive to γ radiation during food irradiation.
A. gramme positive bacteria
B. gramme negative bacteria
C. spores of bacteria
D. toxins of bacteria

5. Sensitivity to irradiation is highest in:
A. aerobic atmosphere
B. anaerobic atmosphere
C. dry foods
D. frozen foods

6. Bakeries have found UV helpful in controlling microorganisms:
A. in interiors of cream-filled pies
B. in flour that is stained by rodent urine
C. in air to prevent spread of viable microorganisms on the surface of bread
D. in jam and jelly fillings

7. Which of these foods has the lowest A_w ?
- Canned fruit in heavy syrup
 - Bread
 - Honey
 - Strawberry jam
8. What is the incubation period for *Listeria monocytogenes*?
- 4 to 28 hours
 - 4 to 21 days
 - 4 to 9 weeks
 - 1 to 2 months
9. The infective dose for *Enteroinvasive Escherichia coli* is;
- 10^2 cells per gram
 - 10^3 cells per gram
 - 10^4 cells per gram
 - 10^5 cells per gram
10. Which one of the following statements is not correct:
- Vibrio parahaemolyticus* will metabolize carbohydrates via fermentation and produce acids but no gas
 - Enterotoxigenic *Escherichia coli* pathogenicity is similar to *Vibrio cholera* group 01
 - Enteropathogenic E. coli* (EPEC) is also known as “infant diarrhea”
 - E. coli* 0157:H7 produce an invasive dysenteric form of diarrhoeal illness in humans.
11. Which one of these pathogens is not intracellular;
- Listeria monocytogenes*
 - Salmonella typhi*
 - Shigella dysenteriae*
 - Vibrio parahaemolyticus*
12. Which one of these pathogens is intracellular
- Yersinia enterocolitica*
 - E. coli* 0157:H7
 - Clostridium botulinum*
 - Bacillus cereus*
13. Which one of these microorganisms grows at the lowest A_w ?
- Clostridium botulinum* type A
 - Clostridium perfringens*
 - Staphylococcus aureus*
 - Vibrio parahaemolyticus*

14. Microorganisms will not grow in a food that has an A_w below:
- A. 0.90
 - B. 0.85
 - C. 0.60
 - D. 0.40
15. Sulfur dioxide is added to foods for which one of these reasons?
- A. to control microorganisms
 - B. as an antioxidant
 - C. to reduce enzymatic browning and non-enzymatic browning
 - D. All of the above
16. Treatments such as drying or freezing affect bacteria in foods in which of these ways?
- A. kill all of them
 - B. have no effect on their viability
 - C. injure some of them
 - D. resuscitate them
17. Which of these classes of bacteria is not distinguished by the temperatures at which its members are able to grow?
- A. mesophiles
 - B. psychrophiles
 - C. thermophiles
 - D. thermoduric
18. Excessive carbon dioxide concentration in the preservation of pears and apples may result in a condition known as:
- A. black heart
 - B. ropey heart
 - C. green heart
 - D. brown heart
19. Enzymatic browning in bruised fruits and vegetables is caused by:
- A. peroxidase
 - B. pectolytic
 - C. phenolase
 - D. maillard reaction
20. Foods with a water activity of 0.93 to 0.85 A_w are likely to be spoiled by:
- A. gram-negative bacteria
 - B. gram-positive bacteria
 - C. Xerophilic molds and osmophilic yeasts
 - D. A and B

[20 Marks]

Question 2

Write short notes on the following;

- a) Milk pasteurization [7]
 - b) Effects of UV irradiation on microorganisms [5]
 - c) Explain the use of UV (ultraviolet light) in the treatment of food. [8]
- [20 Marks]

Question 3

a) Spoilage of canned food stuff maybe due to:

- i) Hydrogen swells [6]
- ii) Thermophilic spoilage [8]

Explain, how these reactions take place in canned foodstuffs?

b) How would you determine whether an egg is fresh or stale after you have already broken the shell? [6]

[20 Marks]

Question 4

a) It is a known fact that foods are stored in the refrigerator in order to increase the shelf-life. How does low temperature affect microbes and contribute to food shelf-life? [12]

b) During the Christmas festive many shops advertise food sales, advise the consumers on the precautions to be taken in order to buy good quality foods and prevent food borne infections. [8]

[20Marks]

Question 5

Good quality milk production start from the farm, advise the Swaziland dairy board on the measures to be taken in order to produce safe and quality milk for their Swazi milk consumers.

[20 Marks]