



UNIVERSITY OF ESWATINI  
Faculty of Health Sciences  
Department of Environmental Health Science

BSc IN ENVIRONMENTAL HEALTH SCIENCE  
MAIN EXAMINATION PAPER 2019

TITLE OF PAPER: **FOOD INGREDIENTS**  
COURSE CODE: EHS433  
DURATION: 2 HOURS  
MARKS: 100  
INSTRUCTIONS: READ THE QUESTIONS AND INSTRUCTIONS CAREFULLY

ANSWER QUESTION ONE AND ANY OTHER THREE  
QUESTIONS

EACH QUESTION CARRIES 25 MARKS

BEGIN EACH QUESTION ON A SEPARATE SHEET OF  
PAPER

WRITE NEATLY AND CLEARLY

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

**QUESTION ONE**

1. Select five (5) of the following types of food additives and give one example of a food product in which they are used, an example of the additive, and at least one function of the additive in the food product.

(15 Marks)

- 1) Vitamins
- 2) Minerals
- 3) Flavour enhancers (INS 620–642 and E620–E640)
- 4) Emulsifiers (INS 429–496 and E431 and E495)
- 5) Stabilizers
- 6) Phosphates (E338–E343)
- 7) Colouring agents (E100–E180 and INS 100–182)
- 8) Antioxidants (INS 300–326 and E300–E326)
- 9) Anti-browning agents

2. What is non-enzymatic browning? (5 marks)
3. How is the ADI value calculated when the NOAEL is derived from animal studies and when it is derived from human data?

(5 Marks)

(25 Total Marks)

**QUESTION TWO**

1. Name the four main sources of food ingredients and give examples of each. (4 Marks)
2. Explain how nutrients are added to fortify cereals. (5 Marks)
3. Sensory scientists are faced with the challenge of making scientifically informed decisions on the suitability of most food additives due to the lack of conclusive toxicological data on these additives. The potential risks of additives are well recognized, but the beneficial role these additives play in food production, processing, and utilization are also felt to be essential to the maintenance of our current food systems.

What is your understanding of balancing the risks and benefits of food additives? Use the lifting of the saccharin ban as an example of balancing risks and benefits of food additives.

(10 Marks)

4. What are the three major goals of food additive intake assessments?

(6 Marks)

(25 Total Marks)

**QUESTION THREE**

1. Discuss the major benefits derived from food additives? (15 Marks)
2. Explain the following words in relation to Food Additives. (5 Marks)
  - i. INS numbering
  - ii. E-System
3. Discuss the direct effects of food additives. (5 Marks)

**QUESTION FOUR**

1. What is the ADI measuring unit? (2 Marks)
2. What is the rationale of food additives intake assessments? (2 Marks)
3. Vitamins are classified as water soluble or fat soluble depending on their characteristics. Give one fat soluble vitamin. (1 Mark)
4. Carotenoids are a form of vitamin A. True/False (1 Mark)
5. What are the two chemical groups of carotenoids? (2 Marks)
6. *What are the three types of flavouring agents?* (3 Marks)

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7. What is your understanding of the symptoms, known as “Chinese restaurant syndrome?” (6 Marks)
8. How do emulsifiers form emulsions of two immiscible liquids like oil and water? Emulsifiers, e.g. Lecithin, are molecules that have two different ends. They bind the emulsion of water and oil: (6 Marks)
- (25 Total Marks)**

**QUESTION FOUR**

1. Define the following terms and give examples of each. (15 Marks)
- Functional Foods
  - Food ingredients
  - Food additives
  - Direct food additives
  - Indirect food additives
2. To protect individuals from the possible adverse effects of food additives, studies to assess the risk of exposure to chemical residues are performed. What are the four basic components of a risk assessment? (4 Marks)
3. Discuss one of these basic components of risk assessment in relation to food additives. (6 marks)
- *Hazard identification*
  - *Dose-response assessment*
  - *Exposure assessment*
  - *Risk characterization*

**(25 Total Marks)**