

In the name of God

Kermanshah University of
Medical Sciences
School of Nutrition
and Food Science.

Title Lesson: Food Microbiology

Audience: Second semester Master of Food Safety

Number and type of unit: 2 theoretical

Prerequisite units: No

time of presentation: Tuesday:10-8

hours of consultation: Sunday 12-10

lecturers/teachers: Dr. Ehsan Sadeghi

Overall objective of the course: to familiarize students with important microorganisms in in food spoilage and foodborne diseases and beneficial microorganisms in food processing.

Description: In this course, the student will be familiar with the factors affecting the growth of microorganisms and food spoilage and will be able to observe them using appropriate practical methods and compare them with microbial standards after counting.

First session: Introduction and Clothing

General Objective: Determining and Specifying Food Microbiology Specific

Special objectives:

- 1- The student knows the definitions and division of microorganisms.
- 2- The student will become familiar with the session titles and history of microorganisms in food.

**Second session: Specialized terminology and their definitions in general target food microbiology:
Determining and reviewing specialized terminology in food**

microbiology specific targets:

- 1- Know the Z index, F index, and D index.
- 2- Understand the thermal death diagram
- 3- Know the D 12 processes.

Learn how to fight microorganisms according to their life cycle.

At the end of the student must:

- 1- Explain the Z index, F index, and D index.
- 2- Draw and explain the thermal death diagram.
- 3- Explain the D 12 process.
- 4- Learn how to fight microorganisms according to their life cycle.

At the end of the student must:

- 1- The student will be able to explain the definitions and classification of microorganisms.

- 2- Describe the history of microorganisms in food.

Sessions 3, 4 and 5: Important bacteria in food (causes of spoilage and foodborne illness)

General objective: To identify and investigate important bacteria in food and factors of spoilage and foodborne illness.

Special objectives:

- 1- The student will become familiar with the characteristics of important bacteria in food.
- 2- Identify foods that are spoiled by specific bacteria.
- 3- Know how to deal with bacteria in food.
- 4- Recognize diseases caused by bacteria in food.

At the end of the student must:

- 1- The student will be able to describe the characteristics of important bacteria in food.
- 2- Describe foods that are spoiled by specific bacteria.
- 3- Explain how to deal with bacteria in food.
- 4- Explain diseases caused by bacteria in food.

Chapter 6: Useful Bacteria in Food

General objective: To determine and investigate beneficial bacteria in food.

Special objectives:

- 1- Identify the types of beneficial bacteria in food.
- 2- Know the types of starters used in the food industry.
- 3- Know the foods associated with each bacteria.

At the end of the student must:

- 1- Explain the types of beneficial bacteria in food.
- 2- Describe the types of starters used in the food industry.
- 3- Explain the foods associated with each bacteria, specifying the bacteria involved.

Seventh session: Midterm exam

Sessions 8, 9, and 10: Important fungi in food (causes of spoilage and disease)

General objective: To identify and investigate important fungi in food and factors of food spoilage and foodborne diseases

Special objectives:

- 1- Know the characteristics of important fungi in food.
- 2- Identify fungi that cause spoilage and disease in food.
- 3- Be familiar with the appearance of fungis in food.
- 4- Become familiar with foodborne fungal diseases.

At the end of the student must:

- 1- Explain the characteristics of important fungi in food.

- 2- Describe the fungi that cause spoilage and disease in food.
- 3- Explain and draw the appearance of fungi in food.
- 4- Explain diseases caused by fungi in food.

Sessions 11 and 12: Useful fungi in food

General objective: To identify and investigate important microbes in meat and meat products.

Special objectives:

- 1- Identify the types of fungi that are useful in food.
- 2- Know the types of fungal starter used in the food industry
- 3- Know the foods associated with beneficial fungi.

At the end of the student must:

- 1- Explain the types of beneficial fungi in food.
- 2- Describe the types of fungal starters used in the food industry.
- 3- Explain the food related to beneficial fungi.

Session 13: Microbiology of Meat and Meat Products

General objective: to determine and examine important germs in meat and meat products

Special objectives:

- 1- Familiarity with *Pseudomonas*, *Moraxyla* and *Sinobacteria*

- 2- Familiarity with the causes of microbial spoilage in meat and signs of spoilage
- 3- Explain and draw the appearance of fungi in food.
- 4- Familiarity with national and international microbial standards of meat

At the end of the student must:

- 1- Specifies the characteristics of *Pseudomonas*, *Moraxella* and *Sinobacterra*.
- 2- Explain microbial corruption factors along with its symptoms in meat.
- 3- Explain microbial pathogens in meat.
- 4- Describe national and international microbial standards in meat.

Session 14: Microbiology of Milk and Dairy Products

General objective: To determine and investigate important microbes in milk and dairy products

Special objectives:

- 1- Know the microbial corruption factors in milk and dairy products.
- 2- Know the microbial pathogens in milk and dairy products.
- 3- Recognize national and international microbial standards in milk and dairy products.

At the end of the student must:

- 1- Explain microbial corruption factors in milk and dairy products.

- 2- Explain microbial pathogens in milk and dairy products.
- 3- Explain national and international microbial standards in milk and dairy products.

Session 15: Microbiology of canned goods, compotes, fruits and vegetables

General objective: To identify and investigate important microbes in canned goods, compotes, fruits, and vegetables

Special objectives:

Understand the microbial corruption factors in the canned.

- 1- Familiarity with microbial corruption factors in the camp.
- 2- Familiarity with microbial corruption factors in fruit.
- 3- Familiarity with microbial corruption factors in vegetables.

At the end of the student must:

- 1- Explain the causes of microbial corruption in conservatives.
- 2- Explain the causes of microbial corruption in the camps
- 3- Explain microbial corruption in fruits
- 4- Explain the effects of microbial corruption in vegetables

Session 16: Microbiology of cereals and seafood products

General Objective: Identification and investigation of important microbes in grains and seafood products

Special objectives:

- 1- Know the factors of corruption in cereals
- 2- Know the factors of corruption in fish.
- 3- Know the factors of corruption in the oyster and shrimp
- 4- Know the corruption factors in crab and marinade.

At the end of the student must:

- 1- Explain the corruption factors in the cereal.
- 2- Explain the factors of corruption in fish.
- 3- Explain the factors of corruption in the oyster and the shrimp
- 4- Explain the corruption factors in crab and marinade

References:

- 1- Frazier and W. C. and Westhoff, D.C. The Last Edition. Food Microbiology. McGraw Hill, New York.
- 2- Jay and J. M. 2004. Modern Food Microbiology. The Last Edition. Van Nostrand Reinhold, N. Y.
- 3- Adams and H. R. and Moss, M.O. The Last Edition. Food Microbiology.

4- Rahul, and Woody. Human pathogens in food. University of Tehran Press, the latest edition.

**Teaching Method: Speech and Questions and Answers
(Master-centered and Student-Hour Training**

Equipment: PowerPoint, Video Projector

assignment:

1. Active participation in classrooms and final testing

Assessment and evaluation:

Completing the final exam in the form of four-choice questions, description, and vacancy of the resources introduced and materials presented in the class.

Measurement and evaluation.

Score	Test method	Test
15	4	The final test.
5	Seminarhormal club	Training activities

Policies:

Honourable students are expected to pay attention to the importance of this unit of study:

- 1) Regular and accurate attendance in classrooms (more than 3 sessions of zero absence).

Participation in class activities and group discussion

3 – Return to sources.

4 in time of homework.

Timetable:

Educational aid	Teaching method	Lesson topic	session
Powerpoint	Group Discussion.	Introduction and general	1.
Powerpoint	Group discussion	Specialized terms and their definitions in food microbiology	2
Powerpoint	Group Discussion	Important Bacteria in Food (Corruption Factors and Foodborne Disease)	3
Powerpoint	Group Discussion.	Important Bacteria in Food (Corruption Factors and Foodborne Disease)	4
Powerpoint	Group Discussion.	Important Bacteria in Food (Corruption Factors and Foodborne Disease)	5
Powerpoint	Group Discussion	Useful bacteria in food	6
Powerpoint	Group discussion	Intermediate test.	7
Powerpoint	Group discussion	Food-related diseases and diseases (8
Powerpoint	Group discussion	Food-related diseases and diseases (9
Powerpoint	Group discussion	Food-related diseases and diseases (10
Powerpoint	Group discussion	Useful mushrooms in food	11

Powerpoint	Group discussion	Useful mushrooms in food	12
Powerpoint	Group discussion	Microbiology of meat and meat products	13
Powerpoint	Group discussion	Milk microbiology and dairy products.	14
Powerpoint	Group discussion	Canned microbiology, compots, fruits and vegetables	15
Powerpoint	Group discussion	Microbiology of cereals and marine food products	16