



Department of Food Technology

College of Agriculture

University of Salahaddin

**Subject: Cheese & Dairy Fermented Products
processing**

Course Book – (Year 4)

Lecturer's name Dr. Nawal H. Sebo

Academic Year: 2023/ 2024

Course Book

1. Course name	Cheese & Dairy Fermented Products processing] (Theory)
2. Lecturer in charge	Nawal Hurmiz Sebo
3. Department/ College	Agriculture/ Food Technology
4. Contact	e-mail - nawal.sebo@su.edu.krd : Tel: 07504451952
5. Time (in hours) per week	Theory: 2 + Practical: 6
6. Office hours	Sunday + Monday 9:30-12:00am
7. Course code	
8. Teacher's academic profile	M.Sc . 1987 , Ph.D. 2008 in food chemistry with excellent experience in different area of food technology subjects , Lecturing different subjects in food technology department for under graduate students, post graduate , assisting in laboratory sections teaching(Food Chemistry ,Dairy Chemistry Industrial Enzymes ,Cheese and Dairy Fermented product Technology ,Food and Dairy Science and Technology ,Biochemistry)and supervising many post graduate thesis . Participating in different activities in the college of Agriculture from administrative point of view and supervising the implementation of some dairy processing plants.
9. Keywords	
10. Course overview:	<p>Cheese & Dairy Fermented products are defined as food products mainly produced from milk and have been part of the human diet for a long period of time since milk is the first nutrient that all new born mammals typically encounter. Cheese & Dairy Fermented products also play an important role in a healthy diet, nutritional value and for high-energy yielding foods. In addition, they also provide unparalleled and versatile taste and texture for personal enjoyment. Today, the availability and distribution of Cheese & Dairy Fermented products result of combining the centuries-old knowledge of traditional milk products together with the applications of modern science and technology. As a result, current dairy industry is highly dynamic, with more new Cheese & Dairy Fermented products constantly being formulated and introduced to the market around the world, thus offering an ever-increasing variety of nutritious and tasteful foods for human.</p>

This course provides general knowledge on Cheese & Dairy Fermented products as well as on various processing technologies that allow human to transform milk into a variety of high quality products .

The course is therefore designed to give a thorough understanding of traditional and new technological processes within the cheese and dairy fermented products industry also to describe production technology and processing lines for the cheese and dairy fermented products industry, It focuses on how to produce, cheese and dairy fermented products,, to value analysis of microbiological properties of cheese and dairy fermented products ,to have a comprehension of industrial hygiene in the dairy fermented products and quality assurance, to explain process design and process calculations in cheese and dairy products describe relations between milk and health, to understand the critical value information on cheese and dairy products ,,critical value information on relations between properties of milk and effects of processing of cheese and dairy fermented products and the functional health benefits derived from consuming dairy products.

11. Course objective:

- 1-The aim of the course is to give scientific background and fundamentals knowledge of traditional and new technological processes within the cheese and dairy fermented products industry.**
- 2- Gain an understanding of cheese and dairy fermented products processing unit operations and production .**
- 3-to integrate concepts in chemistry, biochemistry, physics, with cheese and dairy fermented products processing operations and understand their role in processing of cheese and dairy fermented products.**
- 4-and to gain the ability to think critically about problems and issues in cheese and dairy fermented products processing.**

12. Student's obligation

- 1- Attendance at lectures and labs is required.**
- 2-The student will write notes on their notebook which are written on whiteboard besides the lecture on the data show.**
- 3-Every lecture have a quiz.**

13. Forms of teaching

- 1- Data show, 2-Power point , 3- White board**

14. Assessment scheme

Course content is assessed through two written examinations and class participation with an emphasis

on problem solving related to real life situations that one may encounter in the food industry and written report. Teamwork is critical to the project and grading. Grades will count as below:

Time	theoretical	Practical
During semester	10	35
Participation Conservation and activity, quizzes	5	
Final	50	-

15. Student learning outcome:

1-: Students will demonstrate knowledge of the major core concepts in cheese and dairy fermented products.

2- Students will be able to describe the fundamentals of cheese and dairy fermented products processing and Preservation

3- Students will be able to explain, analyse and evaluate scenarios related to various unit operations in cheese and dairy products.

4-The students will also be capable of using research literature on the subjects and analyzing.

situations in which the cheese and dairy fermented products processing principles may be utilized.

5-Understand factors that affect the cheese and dairy fermented products shelf life and stability.

6- Understand the emerging new cheese and dairy fermented products processing and preservation technologies.

7- Have a general idea of major cheese and dairy fermented products processing industries.

8- Knowledge and understanding about the nature of cheese and dairy fermented products and human nutrition and of the importance of food to health.

16. Course Reading List and References:

1- Fundamentals of Cheese Science. P.F. Fox, T.P. Guinee, T.M. Cogan and P.L.H. Mcsweeney.

2- Microbiology and Biochemistry of Cheese and Fermented Milk, by B.A. Law.

3- Cheese and fermented milk foods by Frank Kosikowski.

4- Milk and Dairy Product Technology by Edgar Spreer.

5- Students are responsible for reading articles that are found in the library and on the Internet

17. The Topics:

	Title of the Subject	Lecture's name	
1st	Origin and history of development of Cheese manufacture, status and scope in Dairy Industry.	Dr.Nawal H. Sebo	Le ex: ex:
2nd	Definition, The transfer of components from milk to cheese, Composition of the cheese, Cheese yield term	Dr.Nawal H. Sebo	

	definition and determination, Nutrition Facts and Information about Cheese.		
3rd	Standard and classification of Cheese.	Dr.Nawal H. Sebo	
4th	The quality and treatment of the milk used to make cheese,Some common cheese making steps, The role of milk compositions in Cheese Making.	Dr.Nawal H. Sebo	
5th	Cheese, additives and preservatives.	Dr.Nawal H. Sebo	
6th	Role of starter culture in relation to cheese quality.	Dr.Nawal H. Sebo	
7th	Bacteriophage (bacterial viruses)	Dr.Nawal H. Sebo	
8th	Rennet preparation and properties.	Dr.Nawal H. Sebo	
9th	Rennet substitutes.	Dr.Nawal H. Sebo	
10th	Action of rennet on milk in relation to cheese manufacture.	Dr.Nawal H. Sebo	
11th	Acid coagulation	Dr.Nawal H. Sebo	
12th	Role of milk constituents and changes during ripening.	Dr.Nawal H. Sebo	

13th	Packaging, storage and distribution of Cheese.	Dr.Nawal H. Sebo	
14th	Classification of fermented dairy products.	Dr.Nawal H. Sebo	
15th	Microbiology and processing of yoghurt and related products. acidophilus products, dahi, cultured butter milk, kefir, koumiss, bifidus milk products.	Dr.Nawal H. Sebo	

18. Practical Topics (If there is any)	
The Topics:	Lecturer's name

In this section The lecturer shall write titles of all practical topics he/she is going to give during the term. This also includes a brief description of the objectives of each topic, date and time of the lecture

19. Examinations:

Q1/Define the following terms: -

Mesophilic cultures, Bacteriocins , Bixin, Semi Hard cheese, Van Slyke equation, kumis , 'mutualism phenomena , N Parmesan.

Q2\ Fill in the blank with appropriate word: -

1- The main goals of cheese making are -----, -----.

2-The blue mold ----- is used in ----- cheese making while the white mold ----- is used in ----- cheese making.

- 3- ----- bacteria produce large holes in ----- cheese while ----- bacteria produce flavor compounds.
- 4- Bleaching agent such as ----- is added in amounts ----- to milk of ----- cheese to -----.
- 5- Semi Hard cheese contains ----- % moisture such as ----- cheese .
- 6- The roles of milk caseins in cheese making are ----- &----- .
- 7- The second phase of milk coagulation by calf rennet is -----it is sensitive to -----
- 8- Emulsifying agents like ----- added to emulsifying fat in some types of cheeses such as ----- which results in -----
- 9- The country of Origin of-----cheese is -----.
- 10- in Germany the term ----- is used to define cheese made from goat's milk such as-----cheese while the term ----- define cheese made from sheep's milk such as-----cheese.
- 11- Calcium chloride is added in amounts ranging between ----- of milk weight which used in cheese manufacturing to -----.
- 12- KNO_3 is added at levels of about -----to 100 liters of-----milk cheese to-----.
- 13- If the MFFB % is < 41 the designation of cheese is called-----such as-----.
- 14- Annatto is extracted from-----tree, its active coloring agent is ----- which becomes ----- when extracted with a -----
- 15- There are many sources of calf rennet substitutes, -----such as-----, ----- such as -----,----- such as -----.
- Q-2- Calculate how much cream containing 25% fat and 1.5% casein must be removed to standardization 2 tons of whole milk which contains 4.5% fat and 2.5% casein prepared to cheese manufacturing. check your calculations?
- Q3/ what is? 1- the purpose of: -
- 1- Milk treatment at very high temperatures during yogurt manufacturing.
- 2- Using of Hydrogen peroxide in cheese making.

3- Search for the calf rennet substitutes.

4-Ripening of milk during manufacturing of some types of cheese.

5- Standardization the ratio of casein: fat in milk prepared for cheese making.

6- Enzyme Cocktails adding during cheese ripening.

Q-4-How can cheese classify according to Rheological and physical characteristics give one example for each class.

Q-5- what is? 1-the purpose 2-amount added 3-in which type of cheese is added, the following additives,1-Oxidizing Agents 2-Annatto 3-peroxide.

Q6\ Write the steps for: -

A- Caseins converting to aromatic compound B-Stirred style yogurt making.

C-Bacteriophage controlling

Q7-A- List with an example the types of calf rennet substitutes.

B- Explain the principles of acid coagulation.

Q8What are the differences between:-

A- Buffalo s', Cow s' and sheep's milk cheese making properties.

B- Bactofugation and Microfiltration.

Q9\ Answer with (Yes) or (No) and correct the wrong:-

1- The M.Wt. of calf Rennet is 60 K Dalton.

2- Removing of the hairy layer from the micelles can be creating by lactic acid adding.

3- Optimum growth range for mesophyllic cultures is 30 - 35C°.

4- Addition of calcium confers bacteriophage resistance.

5-Annatto color is added at range around between 10-20ml \100kg milk.

Q3/Discus the following: -

1- The milk used for cheese making must be free from antibiotic.

2- Milk from a cow with an udder infection (Mastitis)

3- The main and best coagulant used in cheese making is calf rennet.

- 4- Carbon dioxide is added to pasteurized milk prepared for cheese making.
- 5- Milk treatment at very high time/temperatures characterize by difficult curdling during cheese making.
- 6- The milk of end of lactation is not suitable for cheese making.
- 7- Milk treatment at very high time/temperatures produce yogurt with high quality.
- 8- Search for the calf rennet substitutes.

20. Extra notes:

Here the lecturer shall write any note or comment that is not covered in this template and he/she wishes to enrich the course book with his/her valuable remarks.

21. Peer review

پیداچونہوہی ھاوہل

This course book has to be reviewed and signed by a peer. The peer approves the contents of your course book by writing few sentences in this section.

(A peer is person who has enough knowledge about the subject you are teaching, he/she has to be a professor, assistant professor, a lecturer or an expert in the field of your subject).

پیت لہالیہن ھاوہلئیکی ئہکادیمیہوہ سہیر بکریٹ و ناوہرؤکی بابہتھکانی کؤرسہکہ پھسہند بکات و جہند وشہیہک بنوسیت لہسہر شیایوی ناوہرؤکی لہسہر بکات.

کہ زانیاری ھبیت لہسہر کؤرسہکہ و دھبیت پلہی زانستی لہ مامؤستا کہمتر نہبیت.