

**Department of: Food Technology College of Agriculture Engineering Sciences University of Salahaddin**

# Subject: Liquid milk (Theory +Practical) Course Book – (Year 2)

# Lecturer's name: MSc. Dina Suad Ali, Chnar Sulaiman Hadi, Parzhen Sherzad Ibrahim

# Academic Year: 2023/2024

**Course Book**/ **1St semester: 3rd Stage**

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| **1. Course name** | **Liquid milk** | |
| **2. Lecturer in charge** | **Dina Suad Ali** | |
| **3. Department/ College** | **Food Technology dept.- College of Agricultural Engineering sciences.** | |
| **4. Contact** | **e-mail**  [**1 - dina.ali@su.edu.krd**](mailto:1%20-%20dina.ali@su.edu.krd%20%20%20%20%20(tel:))  [**2- chnar.hadi@su.edu.krd (tel**](mailto:2-%20chnar.hadi@su.edu.krd%20(tel)**: 07504731180)**  **3-** [**parzhen.ibrahim@su.edu.krd**](mailto:parzhen.ibrahim@su.edu.krd) **(tel : 07504936425)** | |
| **5. Time (in hours) per week** | **Theory: 2 Practical:** 3 | |
| **6. Office hours** | **thursday(**8:**30-1**0:**30)**  **Tuesday (**10**:30-**1**:30)** | |
| **7. Course code** |  | |
| **8. Teacher's academic profile** | Got bachelor degree at Food Sciences- college of Agriculture /Baghdad university.  Got bachelor degree at computer - college of science /Al mustansiria  university.  Got master degree at Baghdad university.  now teaches as  lecturer in ( Food technology department)/  Salahaddin university. | |
| **9. Keywords** |  | |
| **8. Course overview:**  **Theory:**   * **This course should comprehensively aim at various constituents of milk and milk types standards to make students competent to meet the needs of liquid milk.** * **The course will motivate them to carry out research and facilitate hands on training.** * **This course should impart sound knowledge on various aspects of dairy science, , chemistry and microbiology so as to enable the veterinary graduate to assist the poor farmer or animal owner in augmenting his income.** | |  |
| **9. Course objective:**  **Milk derived from cattle species is an important food. It has many nutrients and the precise nutrient composition of raw milk vary by species and by a number of other factors. Cow milk is available for marketing and utilization in the preparation of various products world over in a large proportion Milk derived from cattle species is an important food. It has many nutrients and the precise nutrient composition of raw milk vary by species and by a number of other factors. Cow milk is available for marketing and utilization in the preparation of various products world over in a large** proportion. | |
| **10. Student's obligation:**  **- 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 thedata show. 3-Every lecture have a quiz.** | |

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| **11. Forms of teaching:**  Teaching Methods: Self Study, Word Microsoft, Power point presentation, Data show and White board**.**  **Practical** A form of teaching is Data show with power point program and laboratory tests. | |
| **12. Assessment scheme:**  Theory 65% (midterm exam15% + final exam 50%) Practical 35% (quiz 5% +30% exam) | |
| **13. Student learning outcome:**  **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.** | |
| **14. Course Reading List and References:**  **1-.Dairy Science and Technology by Pieter Walstra Jan T. M. Wouters Tom J. Geurts(2006)**  **2.Dairy Processing Improving quality by Gerrit Smit (2003)**  **3- Milk and Dairy Product Technology by Edgar Spreer (2017).** | |
| **15. The topics** | **Lecturers name** |
| **1- Milk as Raw Material- Types of Milks, General Characteristics of milk** | **Dina suad ali (2 hrs)** |
| **2-**  **Chemical Composition of Milk.** | **Dina suad ali (2 hrs)** |
| **3- Milk Production in the farm** | **Dina suad ali (2 hrs)** |
| 4 -  **Factors Effecting Quality of Raw milk** | **Dina suad ali (2 hrs)** |
| |  | | --- | | **5**  **Collection and Reception of Milk** | | **6-**  **Transport of Milk in the Dairy** | | **Dina suad ali (2 hrs)**  **Dina suad ali (2 hrs)** |

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| |  |  | | --- | --- | | **7 th Heat Treatments Process in the Dairy Industry** | | | **8th** | **Condensed Dairy Products** | | **9th** | **Milk Powder** |  |  |  | | --- | --- | | **10th** | **Special Milk Products including Imitation** | | **11th** | **Flavored Milk Drinks- Dietetic Milk Products** | | **12th** | **Infant Milk** | | **13th** | **Judging of Milk and Products** | | **14th** | **Cleaning and Disinfection of dairy Factories** | | **Dina suad ali (2 hrs))**  **Dina suad ali (2 hrs))**  **Dina suad ali (2 hrs))** |

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| **16. Practical Topics:** | | |
| **Weeks** | **The curriculum** | **The Target** |
| **1-** | Milk Sampling | Chnar Sulaiman Hadi&Parzhen Sherzad Ibrahim |
| **2** | Quality control tests | Chnar Sulaiman Hadi&Parzhen Sherzad Ibrahim |
| **3** | Milk Acidity determination | Chnar Sulaiman Hadi&Parzhen Sherzad Ibrahim |
| **4-** | Chnar Sulaiman Hadi& **Milk Density and total solids** Parzhen Sherzad Ibrahim | |
| **5** | Milk fat separation and skim milk | Chnar Sulaiman Hadi&Parzhen Sherzad Ibrahim |
| **6** | Milk fat determinatio | Chnar Sulaiman Hadi&Parzhen Sherzad Ibrahim |

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| **7** | Milk standardization | Chnar Sulaiman Hadi&Parzhen Sherzad Ibrahim |
| **8** | yoghurt making(Traditional and Industrial) | Chnar Sulaiman Hadi&Parzhen Sherzad Ibrahim |
| **9** | Exams Chnar Sulaiman Hadi&Parzhen Sherzad Ibrahim | |
| **10** | fermented dairy products | Chnar Sulaiman Hadi&Parzhen Sherzad Ibrahim |
| **11** | chesse making | Chnar Sulaiman Hadi&Parzhen Sherzad Ibrahim |
| **12** | halloumi chesse | Chnar Sulaiman Hadi&Parzhen Sherzad Ibrahim |
| **13** | flavoured milk | Chnar Sulaiman Hadi&Parzhen Sherzad Ibrahim |
| **14** | mastitis | Chnar Sulaiman Hadi&Parzhen Sherzad Ibrahim |
| **15** | milk adulteration  &gymaq making | Chnar Sulaiman Hadi&Parzhen Sherzad Ibrahim |
| 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 | | |

**17. Examinations:**

**Typical questions:**

**19. Examinations**:

**Q1/ Define the following: .**

**UHT milk , Bactofugation , Sediment test, , Spray drier, Sterilized Milk, Alizarine test ,**

**Milk specific heat , Soymilk, Toned milk .**

**Q2 / Select the correct subjects from the following: .**

**1-The main component of milk which is responsible for cooked flavor is:**

**a- Casein b-Triglycerides c-Lactose d-Beta lacto globulin**

**2-The brown color of sterilized milk produced as a result of:**

**a- Millard reaction b- Caramelization c- Both a &b d- Bacteria growth**

**3-Caseins are precipitate at**

**a- pH 6 b- pH6.5 c- pH4.6 d- pH5.8**

**4- The main component of milk which is responsible for whey yellowish green color is**

**a- Riboflavin b-Triglycerides c-Lactose d-No one of them**

**5-Milk is poor in**

**a- Iron b- Protein c-Calcium d- Phosphate**

**6- The consternation of ethanol which used in Alcohol test is**

**a- 85% b- Absolute c- 70% d-Both b & c**

**7-Milk separation achieved at**

**a-35ەc b-30ەc c-25ەc d- 40ەc**

**8- The viscosity of cow milk is**

**a- One time more than of water b- Two times more than of water c-Equal to water viscosity**

**d- Two times less than water**

**9- Milk adulteration by water addition detected by measuring of**

**a- Freezing point b- Acidity c -Specific gravity d-Both a & c**

**10-The white color of milk is due to the**

**a-** **dispersion of reflected light by fat globules and the casein** **b-Carotene**

c- **Vitamin A d- Vitamin B1**

**11- The common cause of Mastitis is bacteria**

**a- *Staphylococcus aureus* b- *Streptococcus agalactiae***

**c-*Escherichia coli*  d-*Streptococcus uberis***

**12-human milk contain high amount of**

**a-Lactose b-Fat c-Whey protein d-casein**

**Q3/List the following**

**1-The percentage and components in milk which provide normal milk natural acidity.**

**2- Factors influenced on efficiency of milk separation.**

**3- The objective of milk compositions standardization.**

**4-** **The membrane separation techniques**

**5- Milk reception operations.**

**Q4A-/What is the importance of the following during processing of milk**

**1-Heat under vacuum in condensed milk manufacturing**

**2- Factors influenced on efficiency of milk separation.**

**3- The objective of milk compositions standardization.**

**4-** **The membrane separation techniques**

**5- Milk reception operations.**

**Q4A-/What is the importance of the following during processing of milk**

**1-Heat under vacuum in condensed milk manufacturing.**

**2-Production of free- lactose milk.**

**3-Milk Clarification.**

**4-** **Production of organic milk.**

**B-** **The fat content of 500 kg of sheep whole milk must be reduced from 6.5% to 3% using skim milk containing 0.1% fat. Calculate the weight of skim milk added and the final wight.**

**Q-5 – Enumerate Dye-reduction tests then write the principle and milk grading according to one of them.**

7- Can sugar.

4- Enzyme used for food processing.

5-Enzyme responsible for food deterioration

6- Main sugar found in fruits.

7- Can sugar.

8-Homotriglyceride.

9-Heterotriglyceride.

10-Natural Antioxidant found in food.

11-Artifitial Antioxidant found in food.

12-Pigment found in meat

Q4/ Answer with (Yes) or (No) and correct the wrong:-

1- all enzymes are proteins.

2-Maltose in non-reducing monosaccharide’s.

3-glucose is sweeter than fructose.

4- Denaturation of this protein leads to converting of the sulfahydral bonds to disulfide groups which are responsible

for the cooked flavor in food.

5-melting point of oleic acid is higher than stearic acid.

6-tartaric acid is the main acid found in citrus.

Q/Conjugate suitable word in list A with list B.

A- BHA, Salting out ,,Ultracentrifugation, Phospholipid, Tyrosine, Rancidity , saturated fatty acid , Svedberg,

B-Lipase, Antioxidant, Emulsifier, Ammonium Sulphate, Aromatic Agent,Caprylic acid, Bioactive protein.

Q/Discuss the following:-

1-Melting point of stearic acid is higher than melting point of lenolenic acid.

2-Proline called imino-acid.

3-Cellulose is not digested in human digestive tract.

4-Fat are solid at room temperatures.

5-Oils are liquid at room temperatures.

6- Electrical behavior of hydrophilic suspended colloids.

7-Mutarotation of carbohydrates.

8- The existence of various sugars with differences viscosity in aqueous solutions.

Q/Fill the following blanks:-

1- ------ is the major carbohydrate fraction in cereal, It is made up of ----- building block.

2- Measuring the inactivation of peroxidase is a method of testing the---------- process efficiency

3- Heating food to above 100oC causes sugar to combine irreversibly with ------ by reaction called------.

4- The melting point of food lipids increased with -------------and decreased with-------------- of fatty acids

5----- gives food a yellowish color.

6-The red color of tomato refer to----------.

Q\ List \1- The reactions that occur during caramelization process. 2- Lipid quality analyses.

B- What is the importance of three of the following enzymes in food industry?

Microbial transglutaminase , Glucose oxidase , Lipoxygenase , Invertase

Q\A-Write the chemical structure of the following fatty acid then rearrange them from lower to higher melting point & classify them according to omega system.

Oleic , Eladic , Linoleic ,Linolinic .

Q\ Write the chemical the chemical equation of apple browning reaction by PPO enzyme

Q\ What are the differences between the LM & HM pectin.

**Q4A-/What is the importance of the following during processing of milk**

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