Dairy Hygiene and Control (advanced)

(705P)

PhD Course Specification

A. BASIC INFORMATION

University:	**Sadat City**
Faculty:	**Veterinary Medicine**
Program on which the course is given:	**PhD in Veterinary Medical Sciences (Dairy Hygiene and Control)**
Department offering the Course:	**Food Hygiene and Control**
Course code:	**705P**
Course title:	**Dairy Hygiene and Control**
Lecture (hr/week):	**2**
Practical (hr/week):	**2**
Course coordinator:	**Dr. Ahmed Moustafa Hammad**

B. PROFESSIONAL INFORMATION

1) Overall aims of course

Upon successful completion of the course, the student will be able to recognize knowledge and systematic activities of quality assurance system applied in dairy farm to produce safe and high quality milk.

2) Intended learning outcomes of course (ILOs)

a) KNOWLEDGE AND UNDERSTANDING

By the end of this course, the graduate should be able to:

a.1. Recognize basic concepts about risk management system and hygienic practices in dairies.

a.2. Identify the basic and general aspect of Hazard Analysis Critical Control Point (HACCP) in milk production and categorize the biological, chemical and physical hazards in dairy farms.

a.3. Be aware with different types of detergents and sanitizers used in dairies and principles of cleaning programs.

a.4. Recognize the sensory properties of normal and abnormal milk.

a.5. Realize concepts of milk scoring according to international standards.

b) INTELLECTUAL SKILLS

By the end of this course, the student should be able to:

b.1. Assess the hygienic practices in dairy farms and suggesting suitable modifications.

b.2. Develop a flow diagram that describes the process of application of HACCP system including critical control points for biological, chemical and physical hazards.

b.3. Plan cleaning programs of the dairies and recommend the suitable detergents and disinfectants.

b.4. Interpret the results of physical, chemical and sensory analysis of milk to grade it according to the international standards.

PROFESSIONAL AND PRACTICAL SKILLS

By the end of this course, the student should be able to:

c.1. Apply modern and rapid techniques for isolation, detection and identification of biological and chemical hazards.

c.2. Test for the efficiency of cleaning of utensils and equipment.

c.3. Perform the sensory tests for scoring milk according to international standards.

c.4. Determine the chemical physical characteristics of fluid milk.

c.5. Detect adulteration of fluid milk.

b.5. GENERAL AND TRANSFERABLE SKILL

By the end of this course, the student should be able to:

d.1. Work effectively as part of a team.
d.2. Efficiently make use of library facilities and IT tools.
d.3. Explore appropriate computer / keyboard skills including word
d.4. Processing, spreadsheets, presentation packages and graph plotting.

3) Topics and contents

Topic	No. of hours		
	Lect.	Pract.	Total
Hygiene practices in liquid milk dairies	6	-	6
Introduction to risk management strategies to ensure safety of liquid milk	2	-	2
Basic and general aspect of Hazard Analysis Critical Control Point (HACCP) in milk production	9	-	9
Implementation and maintenance of the HACCP program	9	-	9
Hazard components; biological, chemical and physical hazards	10	-	10
Steps to HACCP implementation	9	-	9
The principles of an HACCP plan	8	-	8
Principles of Cleaning-in-Place (CIP)	9	-	9
Chemistry of detergents and disinfectants	5	-	5
The processes of cleaning	4	-	4
Planning cleaning project in dairies	2	-	2
Sensory evaluation of milk	8	-	8
Milk scoring techniques according to international standards	7	-	7
Isolation of the spoilage and pathogenic bacteria according to international protocols	-	12	12
Biochemical identification of spoilage and pathogenic bacteria in milk using commercial kits	-	8	8
Identification of biological hazards (bacteria, fungi and viruses) by PCR, Real-time PCR and sequencing of housekeeping genes	-	19	19
Using HPLC and ELIZA for identification of chemical hazards (antibiotic residues, pesticides and mycotoxins)	-	18	18
Assessment of cleaning efficiency using sterility tests	-	3	3
Sensory tests for detection of abnormal milk	-	7	7
Physical analysis of raw milk	-	3	3
Chemical analysis of raw milk	-	8	8
Detecting and quantifying of adulteration of milk with foreign fats, milk of different species, non-milk proteins, and water	-	10	10
Total	**88**	**88**	**176**

4) Teaching and learning methods

a. Lectures to gain knowledge and understanding skills. The teacher usually uses all the available teaching tools like data show. The lectures usually take the form of open discussion.

b. Writing a review paper about the field of specialization to gain the skills of information collection, self-learning and presentation.

c. Practical and lab sessions to gain practical skills.

5) Student assessment

a. **METHODS:**
   4.1. Lectures.
   4.2. Practical.
   4.3. Self-learning activities.

b. **MATRIX ALIGNMENT OF THE MEASURED ILOS/ ASSESSMENTS METHODS:**

	K.U (a)	I.S (b)	P.P.S (c)	G.S (d)
Written exam	1-5	1-4	-	-
Practical exam	-	-	1-5	-
Oral exam	2,3,5	1,2,3	-	-
Student activities (assay, seminar, etc.)	2,4	-	-	**1-4**

c. **WEIGHT OF ASSESSMENTS:**

Assessment	Allocated Mark	Evidence
Final written exam	**50%**	Marked and signed written paper
Practical exam	**20%**	Marked and signed practical exam paper
Oral exam	**20%**	Signed list of oral exam marks
Student activities	**10%**	Assay, presentations, discussions, review

6) List of references

6.1. Essential textbooks

ﺟ **Dairy processing: Improving quality.** Smit, G., 2003. Elsevier.
ﺟ **Dairy processing and quality assurance.** Chandan, R.C., Kilara, A., Shah, N., 2009. John Wiley & Sons.

6.2. Recommended books

ﺝ **The sensory evaluation of dairy products.** Clark, S., Bodyfelt, F.W., Costello, M., Drake, M., 2009. Springer.

ﺝ **Handbook of dairy foods analysis.** Nollet, L.M., Toldrá, F., 2009. CRC Press.

ﺝ **Applied dairy microbiology.** Marth, E.H., Steele, J., 2001. CRC Press.

6.3. Periodicals

ﺝ Journal of Dairy Research

ﺝ International Dairy Journal

ﺝ Journal of Dairy Science

6.4. Web sites

ﺝ www.dairy science.com

ﺝ www.milk.org

7) Facilities required for teaching and learning

7.1 Data-show.

7.2 Laboratory animals for experimental toxicology.

7.3 Network for technology transfer.

7.4 Laboratory kits for experimental toxicology.

7.5 Computer.

	Course coordinators	Head of department
Name	Dr. Ahmed Moustafa Hammad	Prof. Dr. Abd El Rahman El Bagoury
Signature		

Matrix alignment of course topics and ILOs

Topic	No. of hours /week		Total hours	ILOs			
	Lect.	Pract.		K.U (a)	I.S (b)	P.P.S (c)	G.T.S (d)
Hygiene practices in liquid milk dairies	6	-	6	1	1	-	1-4
Introduction to risk management strategies to ensure safety of liquid milk	2	-	2	1		-	1-4
Basic and general aspect of Hazard Analysis Critical Control Point (HACCP) in milk production	9	-	9	2	2	-	1-4
Implementation and maintenance of the HACCP program	9	-	9	2	2	-	1-4
Hazard components; biological, chemical and physical hazards	10	-	10	2	2	-	1-4
Steps to HACCP implementation	9	-	9	2	2	-	1-4
The principles of an HACCP plan	8	-	8	2	2	-	1-4
Principles of Cleaning-in-Place (CIP)	9	-	9	3	-	-	1-4
Chemistry of detergents and disinfectants	5	-	5	3	3	-	1-4
The processes of cleaning	4	-	4	3	3	-	1-4
Planning cleaning project in dairies	2	-	2	3	3	-	1-4
Sensory evaluation of milk	8	-	8	4	4	-	1-4
Milk scoring techniques according to international standards	7	-	7	5	4	-	1-4
Isolation of the spoilage and pathogenic bacteria according to international protocols	-	12	12	-	-	1	1-4
Biochemical identification of spoilage and pathogenic bacteria in milk using commercial kits	-	8	8	-	-	1	1-4
Identification of biological hazards (bacteria, fungi and viruses) by	-	19	19	-	-	1	1-4

Topic	No. of hours /week		Total hours	ILOs			
	Lect.	Pract.		K.U (a)	I.S (b)	P.P.S (c)	G.T.S (d)
PCR, Real-time PCR and sequencing of housekeeping genes							
Using HPLC and ELIZA for identification of chemical hazards (antibiotic residues, pesticides and mycotoxins)	-	18	18	-	-	1	1-4
Assessment of cleaning efficiency using sterility tests	-	3	3	-	-	2	1-4
Sensory tests for detection of abnormal milk	-	7	7	-	-	3	1-4
Physical analysis of raw milk	-	3	3	-	-	4	1-4
Chemical analysis of raw milk	-	8	8	-	-	4	1-4
Detecting and quantifying of adulteration of milk with foreign fats, milk of different species, non-milk proteins, and water	-	10	10	-	-	5	1-4
Total	88	88	176				