**1-Basic information**

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| --- | --- |
| **Course Code:** | S5-MEHG |
| **Course title :** | Hygiene and Control of Meat, Fish & their Products and Animal By- Products |
| **Academic year:** | 5th Academic year 2018-2019 |
| **Program title:** | Bachelor of Veterinary Medical sciences |
| **Contact hours/ week** | 5 hours/week, (2 Lect./week, 3 Practical/week) |
| **Approval Date** |  |

**2-Professional information**

**Overall aims of course**:

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

1. Explain abattoir construction and methods of slaughter of food animals.
2. Perform ante- mortem inspection and post mortem examination of food animals and poultry and giving a judgment for different affections and diseases affecting them.
3. List the parameters of meat keeping quality and production of high quality and safe meat, fish, poultry and their products.
4. Recognize meat microbiology, meat spoilage and food poisoning.
5. Set Chemistry and technological properties of meat, and fish in addition to non meat ingredients.
6. Describe chemical residues in meat and recycling of abattoir by- products.
7. Mention methods of meat, poultry and fish preservation.

**3- Intended learning outcomes of course (ILOs)**

**a-Knowledge and understanding:**

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

a1. Define types of food animals and elicit abattoir (types, and construction) and abattoir related operations (ante-mortem inspection, post- mortem examination, and sanitation).

a2. Outline meat borne diseases, food poisoning and meat spoilage.

a3. Classify different diseases (parasitic, bacterial, viral and mycotic) and affections of meat, fish and poultry.

a4. Describe meat chemistry, meat plant construction and further processing of meat products, and hazard analysis critical control points in meat processing plants.

a5. Recognize chemical residues in meat and animal by-products.

a6. List the factors affecting the growth of microorganisms in food.

a7. Mention the different methods of food preservation and food packaging.

a8. Distinguish lymph nodes of slaughtered animals.

a9. List the factors affecting on meat quality as well as meat quality parameters.

a10. Give examples for abnormal and general pathological conditions of food animals.

**b-Intellectual skills**

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

b1. Recognize the post mortem changes and lesions in slaughtered animals, Fish and poultry.

b2. Differentiate between healthy and diseased parts with the judgment on different affections of meat, meat products, poultry and fish.

b3. Interpret of the results of microbiological and chemical analysis of meat, meat products, fish and poultry.

b4. Compare between bacterial food infection and intoxication.

**C-Professional and practical skills**

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

c1. Examine slaughtered animals (ante- mortem and post-mortem), meat products, fish and poultry.

c2. Design an abattoir and food processing plants, Operate abattoir sanitation, perform meat processing and preservation.

c3. Apply HACCP system in abattoirs and meat processing plants.

c4. Operate laboratory examination of suspected meat, fish and poultry and their products.

c5. Dispose rejected meat and carcasses hygienically.

c6. Identify animal species by naked eye, physically, chemically and biologically.

**d-General and transferable skills**

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

d1. Make decisions.

d2. Manage time.

d3. Work in group teams.

**4-Topics and contents**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course** | **Topic** | **No. of hours** | **Lectures** | **Practical** |
| 5th year- first semster,Meat hygieneLec. 3hrs / week, pract. 2hrs/week | Food animals | 1 | - | 1 |
| Abattoir | 9 | 4 | 6 |
| Lymphatic system | 4 | 2 | 2 |
| Identification of animal species | 5 | 2 | 2 |
| Bacterial diseases | 4 | 2 | 2 |
| Viral diseases | 2 | 2 | 1 |
| Mycotic diseases | 1 | 1 | 1 |
| Parasitic diseases | 5 | 2 | 2 |
| Abnormal and general pathological conditions | 5 | 2 | 2 |
| Affection of specific parts of the carcass | 3 | 1 | 2 |
| Microbiology of meat | 6 | - | 5 |
| Meat spoilage | 4 | 1 | 3 |
| Food poisoning | 4 | 3 | 1 |
| Hazard analysis critical control points (HACCP) system during meat production | 3 | 1 | 2 |
| Keeping quality of meat | 5 | - | 5 |
| Chemical residues in meat | 2 | 1 | 1 |
| Animal by-products | 2 | 2 | - |
| Total |  | 65 | 26 | 39 |
|  |  |  |  |  |
| 5th year- second semster,Meat hygieneLec. 3hrs / week, pract. 2hrs/week | Meat plant design and construction | 1 | 1 | 1 |
| Control of hygienic measures | 2 | - | 2 |
| Chemistry of meat | 2 | 2 | 1 |
| Technology of meat products | 16 | 4 | 12 |
| Application of HACCP system in meat processing plants | 3 | 2 | 1 |
| Introduction to preservation of meat.Preservation by drying | 3 | 2 | 1 |
| Preservation of meat by smoking | 2 | 1 | 1 |
| Preservation of meat by radiation | 2 | 2 | - |
| Preservation of meat by low temperature | 5 | 3 | 2 |
| Preservation of meat by high temperature | 5 | 2 | 3 |
| Food packaging | 1 | 1 | - |
| Fish morphology | 7 | 1 | 6 |
| Post-mortem changes in fish flesh | 1 | 1 | - |
| Fish spoilage | 3 | 1 | 2 |
| Seafood poisoning | 2 | 2 | - |
| Fish processingFish products examination | 3 | - | 3 |
| Poultry slaughterhouse construction | 1 | 1 | - |
| Ante-mortem and post-mortem examination of poultry | 3 | 1 | 2 |
| Poultry affections, processing faults and laboratory examination | 3 | 1 | 2 |
| total |  | 65 | 26 | 39 |

**5-Teaching and learning methods**

5.1- **Lectures:** depending on the sharing efforts of the students and supported with macromedia and multimedia aids.

5.2 **Training visits**: to abattoirs of animals and poultry as well as meat processing plants.

5.3 **Practical sections:** Laboratory diagnosis of suspected meat, fish, poultry and meat products by chemical and microbiological methods, identification of meat species by laboratory methods.

5.4- **Self learning:** Electronic learning, Seminars, scientific search on related websites, international, national and local journals, related books in faculty library.

5.5- **Summer training course**

5.6- **Assays and reviews**

5.7- **Discussion groups**

**6-Teaching and learning methods** **for the students with disabilities**

Office hours and special meeting

**7-Student assessment**

**7.1. Assessments methods:**

|  |  |
| --- | --- |
| **Method** | Matrix alignment of the measured ILOs/ Assessments methods |
| **K&U** | **I.S** | **P&P.S** | **G.S** |
| Final Exam | a1 to a10 | b1 to b4 |  | d1,d2 |
| Practical Exam |  | b1 to b4 | c1 to c6 | d3 |
| Oral Exam | a1 to a10 | b1 to b4 |  | d1 to d2 |

**7.2. Assessment schedules/semester:**

|  |  |
| --- | --- |
| **Method** | **Week(s)** |
| Practical exams | 14th week |
| Final exams | managed by administrations |
| Oral Exam | managed by the department |
| Student activities | managed by the department |

**7.3. Weight of assessments/ semester:**

|  |  |
| --- | --- |
| Assessment | Weight of assessment |
| Practical exams | 30% |
| Final exams | 50% |
| Oral Exam | %20 |
| Student activities (posters, presentations, assays, on going exams.) | - |
|  | 100% |

**8- List of references**

**8.1. Notes and books**

Departmental notes on:

* Text book of Meat Hygiene, Professor/ Fathy Ahmed Khalafalla, 2000. . Deposited No.17664
* Text book of Meat Technology and Preservation, professor/ Fathy Ahmed Khalafalla, 2000. Deposited No.17664

**8.2. Essential books:**

- Meat Hygiene ( J.F. Gracey and D.S. Collins) , ninth edition, 1992( faculty library)

- Handbook of meat product technology (M. D. Ranken, 2000) (faculty library)

- Animal welfare and meat science (N.G.Gregory, 1998) (faculty library)

**8.3. Recommended texts**

- Microbial food poisoning (A.R. Eley, 1992) (Faculty library)

- Fundamental food microbiology (B. Ray, 1996) (Faculty library)

- Poultry meat science (R.I.Richardson, 1999) (faculty library)

- Food microbiology (W.C. Frazier, 1978) (Faculty library)

**8.4. Journals, Websites ……..etc**

**Journals:**

* Journal of food protection
* International journal of food microbiology
* Meat science
* Journal of Food science

**Websites:**

* cms.nelc.edu.eg
* www.pubmed.com
* www.foodprotection.org
* [www.sciencedirect.com](http://www.sciencedirect.com)
* [www.IDF.com](http://www.IDF.com)

**Course Coordinators Head of Department**

 Dr .Nasser S .Abdel-Atty Prof. Fathy A. Khalafalla

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| --- | --- | --- |
| **Topics** | **Week** | **Intended learning outcomes of course (ILOs)** |
| **K&U (a)** | **I.S (b)** | **P.P.S (c)** | **G.T.S (d)** |
|  | Food animals | **1** | **a1** | **-** | **-** |  |
|  | Abattoir | **1-3** | **a1** | **b1** | **c1, c2** |  |
|  | Lymphatic system | **3** | **a8** | **-** | **c1** |  |
|  | Identification of animal species | **4** | **-** | **-** | **c6** |  |
|  | Bacterial diseases | **5** | **a3** | **b2** | **c1,c5** |  |
|  | Viral diseases | **6** | **a3** | **b2** | **c1,c5** |  |
|  | Mycotic diseases | **6** | **a3** | **-** | **-** |  |
|  | Parasitic diseases | **7** | **a3** | **b2** | **c1** |  |
|  | Abnormal and general pathological conditions | **8** | **a3,a10** | **b1,b2** | **c1** |  |
|  | Affection of specific parts of the carcass | **9** | **a3** | **b1,b2** | **c1** |  |
|  | Microbiology of meat | **9** | **a6** | **b3** | **c4** |  |
|  | Meat spoilage | **9-10** | **a2** | **b3** | **c4** |  |
|  | Food poisoning | **10**  | **a2** | **b4** | **-** |  |
|  | Hazard analysis critical control points (HACCP) system during meat production | 11 | **a4** | **-** | **c3** |  |
|  | Keeping quality of meat | 12 | a9 | **-** | **-** |  |
|  | Chemical residues in meat | **12-13** | **a5** | **b3** | **c4** |  |
|  | Animal by-products | **13** | **a5** | **-** | **-** |  |
|  | Meat plant design and construction | 1 | **a4** | **-** | **-** |  |
|  | Chemistry of meat | 1-2 | **a4**  | **b3** | **c4** |  |
|  | Technology of meat products | 2-4 | **a4, a7** | **b3** | **c1, c2, c4** |  |
|  | Application of HACCP system in meat processing plants | 5 | **a4** | **-** | **c3** |  |
|  | Introduction to preservation of meat.Preservation by drying | 6 |  **a7** | **-** | **-** |  |
|  | Preservation of meat by smoking | 6-7 | **a7** | **b3** | **c4** |  |
|  | Preservation of meat by radiation | 7 | **a7** | **-** | **-** |  |
|  | Preservation of meat by low temperature | 8 | **a7** | **b3** | **c4** |  |
|  | Preservation of meat by high temperature | 9 | **a7** | **b3** | **c4** |  |
|  | Food packaging | 10 |  **a7** | **-** | **-** |  |
|  | Fish morphology  | 10 |  | **-** | **c1** |  |
|  | Post catching handling of fish. Fish examination. | 10-11 |  | **b3** | **c1, c4** |  |
|  | Post-mortem changes in fish flesh | 11 | **a5** | **b1** |  |  |
|  | Fish spoilage | 11 | **a2** |  |  |  |
|  | Seafood poisoning | 12 | **a2** |  |  |  |
|  | Fish processingFish products examination | 12 |  | **b3** | **c4** |  |
|  | Poultry slaughterhouse construction | 13 | **a1** |  |  |  |
|  | Ante-mortem and post-mortem examination of poultry | 13 | **a3** | **b1** | **c1** |  |
|  | Poultry affections, processing faults and laboratory examination | 13 | **a3,**  | **b3** | **c1** |  |