

Academic subject: Parasites, Fungi, and Food Pests			
Degree Class: LM-86		Degree Course: Safety and Health of Food of Animal Origin	
		Academic Year: 2020/2021	
		Kind of class: mandatory	Year: I
			Period: I Semester
			ECTS: 6 divided into ECTS lessons: 5 ECTS exe/lab/tutor: 1
Time management, hours, in–class study hours, out–of–class study hours lesson: 60 exe/lab/tutor: 25 in–class study: 0 out–of–class study: 65			
Language: Italian		Compulsory Attendance: No	
Subject Teacher: Maria Stefania Latrofa		Tel./fax: 0805449837 e-mail: stefania.latrofa@uniba.it	Office: Department of Veterinary Medicine, University of Bari, Aldo Moro. Italy
		Office days and hours: Monday and Wednesday From 3:00 pm to 5:00 pm	
Prerequisites: The student must have the basic principles of Parasitology, Biology, Mycology			
Educational objectives: The course aims to provide basic knowledge about the main parasites and fungi that may be transmitted to humans by contaminated food having animal and vegetable origin. The course will also provide insights into pest control programs (mites, flies and cockroaches), contaminants (molds and harmful yeasts) and environmental sanitation processes.			
Expected learning outcomes (according to Dublin Descriptors)		<p>Knowledge and understanding: At the end of the course, the students will improve the knowledge on: i) biological cycles of parasites transmitted by food; ii) importance of these parasites and related diseases in the context of Public Health; iii) control systems for fungal and parasitic contamination in the food chain; iv) main metabolic, structural and biological characteristics of the fungal and parasitic species that contaminate food and livestock products.</p> <p>Applying knowledge and understanding: The students will be able to: i) identify the parasitic and fungal forms that may contaminate the food; ii) distinguish the typical fungal flora of food from the harmful one; iii) identify the factors favoring fungal and parasitic contamination of food; iv) plan methods of control and sanitation of environmental against fungal and parasitic contamination also during the manufacturing of food; v) know the diagnostic laboratory techniques and good laboratory practices.</p> <p>Making judgements: This teaching will help the student to achieve a growing degree of autonomy in judging the activities related to fungal and parasitic food contamination by: (i) the identification the sources of a parasitic and fungal infection and its etiological agent; (ii) carrying out control plans for reducing the risks of infection.</p> <p>Communication: Students will be able to: (i) fully frame their work in wider contexts and motivate the choices made in an understandable and convincing way; (ii) transfer their knowledge adapting the communication method to the needs of the interlocutor; (iii) cooperate effectively in the activities of homogeneous and heterogeneous working groups. These objectives will be pursued and constantly verified during the teaching activity, favoring the active participation of the students during theoretical and practical activities. Students divided in working groups will collaborate in presenting specific topic (i.e., case report, epidemiological studies) trough power point presentations. Students will be encouraged to communicate and improve their skills during the lessons and lab activities provided by the course.</p> <p>Lifelong learning skills: The students will improve the specific terminology of the subject and will be able to move safely and autonomously in the parasitology and mycology laboratories. The students will also acquire the manual skills on the diagnostic methods commonly used in parasitology and mycology laboratories and will be able to analyze the results.</p>	
Course program: Parasitology: Parasites of food of animal origin. Knowledge on parasitic disease. Economic and health aspects relating to the quality and hygiene of food. Health risk assessment. Parasitic zoonoses: giardiasis, cryptosporidiosis, toxoplasmosis, plerocercosis, cysticercosis, hydatidosis, fasciolosis, anisakiosis, trichinellosis, ascariidosis, paragonimiosis and chloronchiosis. Laboratory diagnosis: search for parasites in processed and transformed meats (fresh, chilled, frozen, salted, bagged and canned) and in fish products. Diagnosis and morphological			

identification of different stage of development of parasites (larvae, cysts). Research and identification of mites and insects of health interest. Knowledge on the monitoring and pest control programs (mites, flies and cockroaches). Hints of sanitation in the food industries.

Mycology: General characteristics of Fungi: fungal metabolism. Classification of yeasts commonly found on food: Zygomycetes, Ascomycetes, Deuteromycetes (Aspergillus, Fusarium, Penicillium). Morphological keys used for the Yeasts identification. Fungal contamination of food and livestock productions: meat and cured meat products, dairy products, zootechnical products. Methods for the isolation of fungi from food. Control methods against the yeast development in food products and food preservation.

Teaching methods: The teaching includes theoretical and practical activities. The teaching activities will be held in classrooms equipped with multimedia tools through the projection of power point presentations. Innovative and interactive teachings will be held through online search in specific websites focused on the relationship among parasites, fungi and food. During the cycle of lessons, 2 in itinere tests will be planned to verify the dynamics of learning with respect to the programmed objectives, to adapting the programming and changing, if necessary, the modalities. The practical lessons are carried out in the appropriately equipped laboratories of the Parasitology and Mycology section (Laboratory of Mycology n. 13, Laboratory of Parasitology n. 9, Laboratory of Molecular Biology n. 14). All practical activities carried out by students will be take place under the supervision of the teacher and her collaborators. During the practical activities students will be divided into groups of maximum 2-3 people. At the end of the course the student will have the opportunity to deepen a topic of interest relating to a parasite and / or fungal species / genus associated with food. During the course practical visits to food industries (i.e., slaughterhouse and center for the delivery and shipment of fish products) will be carried out.

Auxiliary teaching: Personal laboratory coat and gloves, cap that will be provided by the staff.

Assessment methods:

The assessment of knowledge takes place through an oral exam on program topics. The candidate will have to exhibit his/her knowledge on biology, on the role of fungi and parasites in contamination of food and during the transformation processes. They will be able to indicate the specific control and prophylaxis plans against food contamination by yeast and parasites.

The integrated examination of Applied Microbiology and Parasitology will be divided into two modules: "Applied Microbiology" and "Parasites, Fungi, and Food Pests". The student must first take the exam of the "Parasites, Fungi and Food Pests" module, then they will be able to access the Applied Microbiology exam. The final score of the integrated course "Applied Microbiology and Parasitology" will be unique and uniformly assessed by the teachers of the two courses that compose it.

Bibliography:

Taylor M.A., Coop R., Wall R., "Parassitologia e Malattie Parassitarie degli Animali", Edizione italiana, EMSI, (2009).
Samson R.A., Hoekstra E., Frisvad J. C., Filtenborg O. (1995): Introduction to food-borne fungi, Fourth Edition Centraalbureauvoor Schimmelcultures, Baarn, The Netherland. Notes edited by Prof.ssa Claudia Cafarchia disponibile online (www.bariparasitology.it).