UCL Université catholique de Louvain

LBRAL2104

2015-2016

Food microbiology

5.0 credits	30.0 h + 22.5 h	2q

Teacher(s) :	Mahillon Jacques ;
Language :	Anglais
Place of the course	Louvain-la-Neuve
Inline resources:	iCampus
Prerequisites :	General Microbiology
Main themes :	The following themes will be addressed, in an integrated way: - Starting from the diversity of the microbial world, development of the notions of commensal, opportunistic and pathogenic micro-organisms (virus, bacteria and fungi) associated with food matrices. Study of the genesis of microbial contaminations in foodstuffs. - Description and illustration of physicochemical parameters associated with the survival, development or elimination of micro-organisms (and their toxins) in foodstuffs. - Description of the main entero-pathogenic bacteria in human and the molecular and microbiological methods implemented for their detection, characterization and discrimination. - Strategy to implement for the prevention of microbial contaminations and intoxications, to limit their development and, when necessary, to counteract their effects.
Aims :	a. Contribution of this activity to the L.O. 1.1, 1.2, 1.3, 1.4 2.1, 2.2, 2.3 3.6, 3.7, 3.8 4.1, 4.2, 4.5, 4.7 6.5, 6.8 7.1, 7.2 8.5, 8.6 b. Specific formulation of L.O. for this activity, in the program At the end of this activity, the student is able to: 1. Identify, describe and distinguish bacterial and viral pathogens and opportunists, as well as protozoa and helminths involved in food toxi-infections. 2. Identify, describe and distinguish bacterial involved in food spoilage. 3. Recognise, on the basis of symptoms and syndromes displayed by sick or affected persons, the pathogens potentially involved in food toxi-infections. 4. Recognise, on phenotypic bases, micro-organisms potentially involved in the alteration and spoilage of foodstuffs or the modification and degradation of the organoleptic quality of food matrices. 5. Determine and recommend the conventional and/or molecular methods to be implemented in the detection and discrimination of pathogenic, opportunistic and spoilage micro-organisms in food matrices. 6. Choose, argue and justify the use of normalized reference methods (ISO) to be used in the protocols for the detection of pathogenic and opportunistic micro-organisms. 7. Recommend the most appropriate physicochemical and/or biochemical methods to control/prevent pathogenic, opportunistic or spoilage micro-organisms in food matrices. 8. Display a strict confidentiality, a complete impartiality and a total independence in the treatment of analytical data and client/customer reports. *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Evaluation methods :	- Written exam with three parts: & t; Resolution of a foodborne problem and/or a case analysis, & t; A theoretical development of a specific section of the course, & t; A series of definitions/concepts calling for short answers. - Evaluation of the report of the practical work performed by the student and feedback to the students before their written exam.

Teaching methods :	- Main activity given as ex cathedra courses, which includes many practical examples and case studies. - Participation of invited speakers (scientific colleagues and/or colleagues from the agro-food sector). - Practical work (mandatory activity): & t; Groups of 2 to 3 students, & t; Case study under the supervision of an assistant/technician team, & t; Directed team work on a PC, & t; Writing of a report (one per group). - Excursions and guided visits in Agro-Food enterprises and/or routine laboratories for microbiological analyses.
Content :	1. Table of content I. Microbes in food II. Spoilage microflora III. Food pathogens: Gram - IV. Food pathogens: Gram + V. Virus and food VI. Protozoa and helminths in food VII. Mycotoxins VIII. Detection methods IX. Control methods 2. Supplementary activities Practical work is organised for the students to get acquainted with the basic 'manipulations' of pathogenic bacteria associated with foodstuffs, including their culture, and their identification through conventional and molecular microbiology techniques. This activity also includes all the appropriate security measures associated with these manipulations.
Bibliography :	- Mandatory course support: «PowerPoint» documents, available as pdf files on iCampus. - Facultative and complementary information: Doyle, M.P. & mp; Beuchat, L.R. (Eds) (2007) Food Microbiology - Fundamentals and frontiers. American Society for Microbiology, ASM Press, Washington D.C., USA, 1038 pp. - ISBN-13: 9781555814076. Adams, M. R., Moss, M. O. (2008) Food Microbiology (3rd Edition). Springer Verlag, 577 pp. - ISBN: 978-0-85404-284-5.
Faculty or entity in charge:	AGRO

Programmes / formations proposant cette unité d'enseignement (UE)

Intitulé du programme	Sigle	Credits	Prerequis	Acquis d'apprentissage
Master [120] in Biomedical Engineering	GBIO2M	5	-	
Master [120] in Biochemistry and Molecular and Cell Biology	BBMC2M	5	-	
Master [120] in Agricultural Bioengineering	BIRA2M	5	-	
Master [120] in Chemistry and Bioindustries	BIRC2M	5	-	
Advanced Master in Bio-engineering : Brewery	BRAS2MC	5	-	
Advanced Master in Food Science and Technology	ALIT2MC	5	-	