UCL Université catholique de Louvain

LBRAL2104

2012-2013

Food microbiology

5.0 credits	30.0 h + 22.5 h	2q

Teacher(s) :	Mahillon Jacques ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	In order to fulfil the proposed objectives, the following themes are developed through an integrated approach: - Using the food fermentation processes, illustration of the major contribution of microorganisms to the transformation, maturation and conservation of food and feed products. - Starting from the microbial diversity, description of the notions of commensal, opportunistic and pathogenic microorganisms (virus, bacteria and fungi). Study of the genesis of microbial contamination in foodstuffs. - Description and illustration of the physical and chemical parameters allowing the survival, the development or the elimination of microorganisms, and their toxins, in foodstuffs. - Description of the main enteropathogenic bacteria in man (epidemiology, virulence mechanisms and pathology) and the microbiological and molecular methods used for their detection, characterisation and discrimination. - Notions of equilibrium/non-equilibrium between bacterial virulence and the host defence mechanisms. Impact of the antibiotherapy on the bacterial world and the consequences in terms of public health. - Strategies required for preventing microbial infection and intoxication, to limit their developments and, if necessary, avoid their effects.
Aims :	The main objective of this course is to give the student an overview of the quality and security issues associated with the consumption, mainly human, of foodstuffs and food products. More specifically, on the basis of a circumstantial microbiological analysis of food products, the student should be able to evaluate, and discriminate, the type and level of hazards associated with a particular food. He should be able to determine the conditions necessary for the prevention or control of microbial contaminants. Corollary, a correct assessment of the risk linked to the consumption of a food product will be required. Finally, on the basis of his acquired knowledge, the student should be in a position to decide on the fate of food product, including the potential application of appropriate transformations or treatments necessary for its consumption. *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".*
Content :	This course contains three modules. Part A: General context and strategy of control This part is dedicated to the influence of parameters involved in the type and importance of microbial flora in food products. In particular, it includes the source and frequency of contamination, the types of food pathogens, the food characteristics and its immediate environment. The interaction among these different factors, in term of antagonism and synergy, will be analysed. The evolution of the microbial populations in the contaminated food is then studied, together with the appropriate methods allowing to prevent, or to control, the microbial contamination. This part also includes the issues related to the microbiological standards, the sampling strategies, the indicator microorganisms and the relevancy of their use. Part B: Food contamination and infections This module deals with the issues of diversity and differential virulence observed among the microorganisms encountered in food products and processes. It develops the molecular techniques and strategies used in this context of microbial virulence. This section also integrates the concepts of food contamination and intoxication, including the various aspects of human and animal diseases. Part C: Seminars and practical exercises The opportunity is given to the students to get acquainted to the strategies and practical methods used in the microbiological analyses of food products. After being tough the basic microbiological methods, the students receive for analysis either naturally or artificially contaminated food. They have to practise by their own the appropriate methods for the detection and characterisation of the contamination or spoilage microflora. The methods include immunological and molecular approaches. These practical exercises are completed by a series of focused seminars, presented either by the students or by experts from the academic, scientific or professional spheres.
Other infos :	Precursory courses General Microbiology Evaluation At the end of the course, a formal (written and/or oral) evaluation is organised on a series of selected sections of the course. Support Lecture notes, overhead copies (paper printouts of PowerPoint files) and several reference textbooks. Teaching team A team of teachers, whose expertise covers the fields of food virology, bacteriology and mycology.

Cycle and year of study :	> Master [120] in Chemistry and Bio-industries > Master [120] in Agricultural Bioengineering > Master [120] in Biomedical Engineering > Advanced Master in Bio-engineering : Brewery > Advanced Master in Food Science and Technology > Master [120] in Biochemistry and Molecular and Cell Biology
Faculty or entity in charge:	AGRO