

Faculty of Biological, Agronomic and Environmental Engineering

BRAL2102 Nutritional biochemistry and human food needs

[45h+0h exercises] 3.5 credits

Teacher(s): Yvan Larondelle
Language: French
Level: Second cycle

Aims

At the end of the course, the student must have acquired a satisfactory understanding of the relationships between, on one hand, foods, nutrients and eating habits and, on the other hand, human metabolism, well-being and health, through a good knowledge of the effects of these foods, nutrients and eating habits on the major metabolic pathways, inter-organ relationships and physiological functions of the body.

Main themes

To reach its objectives, the course comprises a general overview of the metabolism of carbohydrates, lipids and protides, with a special focus on carbohydrates, lipids and protides originating from the diet, a detailed presentation of the human dietary requirements (energy, nitrogen, amino acids, essential fatty acids, vitamins, water, minerals, dietary fibres) including the biochemical and metabolic justifications, and an in-depth study of the relations between diet and health using some applied examples (diabetes, cardiovascular diseases, #).

Content and teaching methods

The course is made of three complementary parts :

Part A (1.5 ECTS) starts with a detailed study of the physiology of digestion and absorption, followed by a synthetic summary of the metabolism of carbohydrates, lipids and protids. It continues with the relationships between nutrition and metabolism through several examples of specific metabolic situations, such as starving, lactating or suffering from diabetes. It ends up with the relation between nutrition and human health improvement, through the analysis of specific topics such as the impact of dietary lipids on cardiovascular diseases, and the concept of functional foods. Part B (1 ECTS) presents the nutritional requirements of humans together with the corresponding recommended daily allowance, in terms of energy, nitrogen, amino acids, essential fatty acids, vitamins, water, minerals and dietary fibres, with, in each case, a special focus on the biochemical justification of the needs.

Part C (1 ECTS) corresponds to a series of seminars aiming at illustrating the relations between food and health. These seminars are prepared by the students on the basis of scientific articles and/or are given by senior scientists specialized in the field.

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Precursory courses Basic knowledge in structural and metabolic biochemistry

Evaluation Written examination and evaluation of the presentations made by the students (Part C)

Support Textbooks, scientific papers and copy of the PowerPoint presentations of the teacher

Programmes in which this activity is taught

BIR2 Bio-ingénieur
NUT2 Licence en sciences biomédicales (nutrition humaine)

Other credits in programs

BIR22/1A	Deuxième année du programme conduisant au grade de bio-ingénieur: sciences agronomiques (Sciences, technologie et qualité des aliments)	(3.5 credits)	Mandatory
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