Study program: Integrated Academic Studies in Pharmacy

Course title: Bromatology

Teacher: Ljilja D. Torović, Jelena N. Jovičić Bata

Course status: compulsory

ECTS Credits: 7

Condition: -

Course aim

To introduce students to the relationship between food, nutrition and health in order of good health promotion. Food safety legislation and risk assessment approaches. Food analysis methods.

Expected outcome of the course:

Student should be familiar with the food composition and biochemistry, basic principles of optimal diet (nutrition recommendations), the roles of nutritive and regulatory substances, food safety legislation and risk analysis, risk and benefit of food additives.

Student should be familiar with food analysis methods in the assessment of food quality and safety and should know the basic principles of the rational use of dietary supplements.

Course description

Theoretical education

Food, diet, health and pharmacy. Energy requirements of different population groups. Food energy value. Proteins in food: biochemical characteristics, nutritive characteristics, new protein sources. Proteins and health: physiological roles, requirements of different population groups. Food allergies and intolerance. Lipids in food: biochemical characteristics, oxidative degradation, fatty-acid composition and health indices, lipid substitutes. Lipids and health: physiological roles, requirements of different population groups, health risks. Carbohydrates in food: biochemical properties. Food-composition databases. Carbohydrates and health: physiological roles, requirements of different population groups, dietary fibers, glycemic index of foods, health risks. Regulatory substances: vitamins and minerals. Water soluble vitamins and health: physiological roles, requirements of different population groups. Fat soluble vitamins and health: physiological roles, requirements of different population groups. Macro minerals: physiological roles, requirements of different population groups. Micro minerals (trace minerals): physiological roles, requirements of different population groups. Drinking water: physiological roles, requirements of different population groups, health risks and safety. Non-nutritive dietary constituents. Nutrition care process and pharmacy. Foods for special dietary uses. Infant formulae. Dietary supplements: possibilities for use and rational use in different population groups. Probiotics, prebiotics and symbiotics. Dietary supplements in diseases caused by inadequate diet. Dietary supplements in athletes' diet. Food-drug interactions. Genetically modified (GMO) food. Organic food. Functional food - encapsulation and targeted delivery of biologically active food constituents. New food. Food labeling. Nutrition and health claims. Food safety legislation and preventive systems in ensuring food safety. Nutrivigilance. Risk analysis: management, communication and risk assessment. Risk assessment: identification and characterization of hazard, exposure assessment and risk characterization. Nutrient and allergen risk assessment. Chemical contaminants risk assessment: natural toxic food ingredients (alkaloids, mycotoxins, nitrate, nitrite and nitrosamines); environmental contaminants (toxic elements, polychlorinated biphenyls and dioxins, polycyclic aromatic hydrocarbons); processing contaminants (acrylamide); pesticides residues; veterinary drugs residues. Food additives: legal aspects, risks and benefits. Food flavorings. Current topics in food safety in public health (microplastics in food, emerging contaminants). Safety of food packaging materials and cosmetics.

Practical education

Energy requirements of different population groups. Protein determination by the method of Kjeldahl. Determination of hydroxyproline in meat and meat products. Determination of fat by the method of Soxhlet. Determination of the constants of fats and oils: saponification number. Deterioration of fats and oils: peroxide number. Determination of sugars by the method of Luff-Schoorl's. Drinking water (mineral water) safety. Preparation of water samples by solid phase extraction for the analysis of pesticide residues. Preparation of food samples by QuEChERS method for the analysis of pesticide residues. Analysis of pesticide residues using gas chromatography – mass spectrometry. Chromatographic determination of food colors. Determination of nitrite in meat products. Determination of preservatives, sweeteners and flavors by HPLC. Labeling of foodstuffs. Nutrition and health claims. Rational use of dietary supplements.

Literature

Compulsory

1. Novaković B, Jusupović F, editors. Nutrition and health. Novi Sad (Serbia): Faculty of Medicine; 2019.– selected chapters translated into English
2. Novaković B, Torović Lj, editors. Bromatology - food quality and safety. Novi Sad (Serbia): Faculty of Medicine; 2023. – selected chapters translated into English

Additional

1. http://www.efsa.europa.eu
2. http://www.codexalimentarius.net
3. http://ec.europa.eu/food
4. http://www.who.int

Number of active classes	**Theoretical classes:** 60	**Practical classes:** 45

Teaching methods: theoretical and practical education.

Student activity assessment (maximally 100 points)

Pre-exam activities	**points**	**Final exam**	**points**
Lectures	10	Written	
Practices	10	Oral	60
Colloquium	20		
Essay			