

Nutrition and Food science

MODULE	CONTENT	YEAR	TERM	CREDITS	TYPE
MEDICINE AND PHARMACOLOGY	NUTRITION AND FOOD SCIENCE	4th	2nd	6	Mandatory
LECTURER(S)			Postal address, telephone n°, e-mail address		
<ul style="list-style-type: none"> • Belén García Villanova Ruiz • Eduardo Jesús Guerra Hernández • Heminia López García de la Serrana • Javier Montilla Gómez • Miguel Navarro Alarcón • María Dolores Ruiz López 			Department of Nutrition and Food Science, 3rd floor, School of Pharmacy. Office numbers: 313 (958 243869: Dr. Ruiz López), 315 (958 243866: Dr. García Villanova Ruiz), 316 (958 243867: Drs. Guerra Hernández and Montilla Gómez), 317 (958 243868: Dr. López García de la Serrana) y 318 (958 249766: Dr. Navarro Alarcón). Email: belenv@ugr.es , ejuerra@ugr.es , herminia@ugr.es , jmont@ugr.es , nalarcon@ugr.es y mdruiz@ugr.es		
DEGREE WITHIN WHICH THE SUBJECT IS TAUGHT					
PHARMACY					
PREREQUISITES and/or RECOMMENDATIONS (if necessary)					
Having studied the subjects of Biochemistry and Physiology					
BRIEF ACCOUNT OF THE SUBJECT PROGRAMME (ACCORDING TO THE DEGREE ¿??)					
Human nutrition and dietetics. Analytical criteria and health of food.					
GENERAL AND PARTICULAR ABILITIES					
GENERAL ABILITIES <ul style="list-style-type: none"> • Providing advice in drug and diet therapy as well as at the nutritional and food area level food in the area in the establishments in which they render service. • To participate in the activities of health promotion and disease prevention, at the individual, family and community level, with a comprehensive and multidisciplinary view of the health-disease process. • To develop hygienic-sanitary analysis, especially those related to food and the environment. • To recognize own limitations and the need to maintain and update professional skills, giving special importance to the self-learning of new knowledge based on available scientific evidence. 					



PARTICULAR ABILITIES

- To develop health and hygiene analysis (biochemical, food science, microbiological and parasitological analyses) related to general health and food and the environment in particular.
- To acquire the necessary skills to provide therapeutic counseling on drug and diet therapy and nutritional and dietary advice to users of the establishments in which they serve.
- To understand the relationship between food and health, and the importance of diet in the treatment and prevention of disease.
- To learn the techniques related to analytical laboratory, diagnosis, toxic, food and environment.

OBJECTIVES (EXPRESSED IN TERMS OF EXPECTED RESULTS OF THE TEACHING PROGRAMME)

At the end of the course the student is expected to be to be able:

- To know the nutrients, namely their functions, health implications and food sources.
- To know the composition and nutritional value of food, nutritional requirements and recommendations.
- To know the characteristics of a balanced diet, the nutritional guidelines in the life cycle and dietary recommendations in diseases of the consumer society.
- To demonstrate the understanding of the hygienic aspects and analytical control of food

DETAILED SUBJECT SYLLABUS

THEORETICAL PROGRAM

THEMATIC UNIT I: INTRODUCTION

Item 1. Presentation of the subject. Concept of Nutrition, Food Science, Dietetics, Food Technology and Food Security. Role of the pharmacist in the field of Nutrition and Food Science.

THEMATIC UNIT II: NUTRITION

CHAPTER I: Energy requirements and nutritional

Item 2. Energy requirements of the human body. Components of energy metabolism: basal metabolism, thermogenesis and physical activity. Measuring methods.

Item 3. Food: source of energy, nutrients and other bioactive components. Energy value of nutrients. Tables of food composition and nutritional databases. Labelling.

Item 4. Requirements and nutritional recommendations. Nutritional goals. Dietary Guidelines. Concept and criteria for establishing them. Applications and limitations. Balanced diet: standards and characteristics governing nutritional balance.

CHAPTER II: Nutrients

Item 5. Macronutrients: Carbohydrates, lipids and proteins. Functions and sources. Role in health. Dietary recommendations.

Item 6. Macroelements and microelements. Current importance. Functions and sources. Dietary recommendations.



Item 7. Water: nutritional significance. Water balance. Needs and source.

THEMATIC UNIT III: OVERVIEW OF FOOD

CHAPTER III. Food law

Item 8. Food law. Spanish legislation on food: technical and sanitary regulations, general quality standards and official methods of analysis. Food law in the European Union. International organizations: FAO / WHO (Codex Alimentarius mundi)

CHAPTER IV: Food additives

Item 9. Concept of food additive. Aids. Safety criteria. Classification and functions.

CHAPTER V. Food hygiene

Item 10. Alterations of food. Concept of alteration, life and shelf life. Alterations in chemical and biochemical type. Microbiological changes. Factors that regulate them. Impact on quality and food safety.

Item 11. Disorders of food. Alterations of chemical and biochemical type. Regulatory factors. Prevention. Impact on quality and food safety.

Item 12. Food preservation: General principles. Physical methods of preservation: Asepsis, filtration, protective atmospheres, high and low temperatures. Drying and freeze drying. Ionizing radiation. Applications.

Item 13. Food preservation: Methods affecting sensory properties: salting, smoking, pickling, sugar and alcohol addition. Additives (chemical preservatives)

Item 14. Concept of hazard and health risks: Classification of the hazards associated with food consumption. Biological, chemical and physical hazards. Sanitary control: General Hygiene Plans (PGH). Hazard analysis and critical control points (HACCP).

THEMATIC UNIT IV: FOOD GROUPS

CHAPTER VI: Protein foods

Item 15. Meat and meat products. Chemical composition and nutritional importance. Effects of processing on the nutritional value.

Item 16. Fish and seafood. Chemical composition and nutritional importance. Effect of processing on the nutritional value.

Item 17. Eggs and egg products. Structure. Chemical composition and nutritional importance.

Item 18. Milk and dairy products. Classification. Chemical composition and nutritional importance.

CHAPTER VII: Lipid foods

Item 19. Animal fats. Cream, butter and other animal fats. Chemical composition and nutritional importance.

Item 20. Vegetable fats. Olive oil and seed oils. Modified fats: margarine. Chemical composition and nutritional importance.



CHAPTER VIII: Food hydrocarbon

Item 21. Cereals. Structure, composition and nutritive value. Derivatives of the flours. Bread and pasta. Chemical composition and nutritional importance. Nutritional implications of other cereal products.

Item 22. Legumes: classification, chemical composition and nutritional importance.

Item 23. Vegetables and fruits. Classification. Commercial preparations. Chemical composition and nutritional importance.

Item 24. Nuts. Chemical composition and nutritional importance.

CHAPTER IX: Other foods

Item 25. Non-alcoholic beverages and stimulating foods. Classification. Chemical composition and nutritional importance.

Item 26. Alcoholic beverages. Wine: definition, composition and classification. Beer: definition, types and composition. Other alcoholic beverages: cider, spirits and liqueurs. Nutritional implications of drinking

THEMATIC UNIT V: DIETETICS

Item 27. Diet concept. Human nutrition in the life cycle periods: nutrition during pregnancy and lactation. Nutrition in the first year of life. Physiological changes and nutritional needs. Energy and nutrient needs. Recommended food groups.

Item 28. Nutrition in childhood and adolescence. Physiological changes and nutritional needs of young children (preschool), school children and adolescents. Recommended foods.

Item 29. Nutrition in older people. Concept of aging. Physiological changes related to nutrition. Nutritional needs. Recommended foods.

Item 30. Diet and chronic disease prevention. The diet as a cause of protection: overweight and obesity, diabetes, cardiovascular disease, cancer. Food and osteoporosis. Guidelines and dietary advice.

SEMINARS

First seminar: Labelling. Nutrition and health claims in food

Second seminar: Diseases of the consumer society. The diet as a protective factor: overweight and obesity, diabetes, cardiovascular disease, and cancer. Food and osteoporosis. Guidelines and dietary advice.

PRACTICAL PROGRAM

NUTRITION and DIET

Practice 1. Calculation of basal metabolism and total energy requirements



Practice 2. Calculating the energy profile of a diet and quality indexes

Practice 3. Use of food composition tables and alcoholic energy drinks.

Practice 4. Nutritional labeling of foods. Food ration concept.

Practice 5. Pyramid. Reference intakes. Nutritional goals.

Practice 6. Registration and evaluation of a 5-day diet. Assessment of nutritional status.

FOOD SCIENCE

Practice 1. - Introduction. Food analysis. Brief classification and utilities.

Practice 2. Drinks: Determination of Brix of juices

Practice 3. Oils: refractive index, peroxide value and acidity.

Practice 4. Milk density, acidity and enzymes (peroxidase, alkaline phosphatase).

Practice 5. Flours: moisture and gluten

Practice 6. Edible fats: fat in food extraction and determination of fatty acids by GC.

Practice 7. Alcoholic beverages: Alcohol. Preservatives: sulfites

READING

KEY LITERATURE:

- NUTRITION AND DIETETICS

- ASTIASARAN I, LACERAS B, ARIÑO A, MARTINEZ A (2003). Alimentos y nutrición en la práctica sanitaria. Díaz de Santos. Madrid.
- BELLIDO GUERRERO D, DE LUÍS ROMÁN DA (2006). Manual de nutrición y metabolismo. Ed. Díaz de Santos, Madrid.
- CERVERA P, CLAPÉS J, RIGOLFAS R (2004). Alimentación y dietoterapia (Nutrición aplicada en la salud y la enfermedad). 4ª edición, Ed. Interamericana McGraw-Hill. México.
- CESNID (2008). Tablas de composición de alimentos por medidas caseras de consumo habitual en España. Ed McGraw-Hill, Madrid.
- GIBNEY MJ, KOK FRANS J, VOSTER HESTER H (2005). Introducción a la nutrición humana. Ed. Acribia, Madrid.
- GIL A (2010). Tratado de Nutrición (4 tomos). Ed. Panamericana. Madrid.
- MAHAN LK, ESCOTT-STUMP S (2009). 12ª ed. Krause Dietoterapia, Ed. Elsevier, SL Barcelona.
- MATAIX VERDU J (2009). Nutrición y alimentación humana (2 tomos). Ed. Ergon. Madrid.

- FOOD SCIENCE

- ASTIASARAN I, MARTÍNEZ J (2000). Alimentos: Composición y propiedades. Ed. McGraw-Hill. Interamericana. Madrid.
- BARROS C (Recopilador) (1997). Legislación Alimentaria. Alimentaria. Madrid. 1976- Actualizado con CD.
- BELITZ HD, GROSCH W (1997). Química de los Alimentos. 2ª Edición. Ed. Acribia. Zaragoza. (la 3ª edición en lengua inglesa está publicada en 2004).
- BELLO J (2000). Ciencia bromatológica. Principios generales de los alimentos. Ed. Díaz de Santos. Madrid.



- LEGISLACIÓN ALIMENTARIA. Código alimentario español y disposiciones complementarias (2006). Ed Tecnos. Madrid.
- FENNEMA OR (2000). Química de los alimentos. 2ª ed. Ed. Acribia. Zaragoza.
- FORSYTHE SJ, HAYES PR (2002) Higiene de los Alimentos, Microbiología y HACCP. 2ª Ed. Acribia, Zaragoza.
- GIL A, RUIZ MD (2010). Tratado de Nutrición. TOMO II. Composición y Calidad Nutritiva. Ed. Panamericana. Madrid.
- BADÍ DERGAL S (2006). Química de los alimentos, 4ª ed. Ed. Pearson, México.
- BALTES W (2007). Química de los alimentos, 5ª ed. Ed. Acribia S.A. Zaragoza.
- BELITZ HD, GROSCH W, SCHIEBERLE P (2012). Química de los alimentos, 4th ed. Ed. Springer-Verlag, Leipzig.
- RODRÍGUEZ RIVER VM, SIMÓN MAGRO E (2008). Bases de la alimentación humana. Ed. Netbiblo, S.L. La Coruña.
- QUÍMICA DE LOS ALIMENTOS, 3ª Edición. DAMODARAN S., PARKIN K. L., FENNEMA, O. R. Editorial Acribia, S. A. Zaragoza 2008.

ADDITIONAL LITERATURE:

- NUTRITION AND DIETETICS

- MARTINEZ JA (2004). Fundamentos teórico-prácticos de Nutrición y Dietética. Ed. Interamericana McGraw-Hill, Madrid.
- MINISTERIO DE SANIDAD Y CONSUMO (1995). Tablas de composición de alimentos españoles. Ed. Ministerio de Sanidad y Consumo. Secretaría General Técnica. Centro de Publicaciones, Madrid.
- MUÑOZ M, ARANCETA J, GARCIA-JALON I (2004). Nutrición aplicada y dietoterapia. 2ª ed. Ed. Eunsa. Pamplona.
- REQUEJO A, ORTEGA RM (2000). Nutriguía. Manual de Nutrición clínica en atención primaria. Ed. Complutense. Madrid.
- SALAS-SALVADO J, BONADA A, TRALLERO R, SALÓME, BURGOS R (2008). Nutrición y Dietética Clínica. 2ª ed. Ed. Masson. Barcelona.
- SENC (2004). Guías de la alimentación saludable. Edita Sociedad Española de Nutrición Comunitaria. Madrid.
- SERRA MAJEN L, ARANCETA J (2006). Nutrición y salud pública: métodos, bases científicas y aplicaciones, 2ª ed. Ed. Masson, Madrid
- SHILS ME, OLSON JA, SHIKE M (2002). Nutrición en Salud y Enfermedad. 9ª ed. (2 tomos). McGraw-Hill. México.
- SORIANO DEL CASTILLO JM (2006). Nutrición básica humana. Ed Universidad de Valencia.
- VAZQUEZ C, DE COS AI, LOPEZ NOMDEDEU C (2005). Alimentación y nutrición. Manual Teórico-Práctico, 2ª ed. Díaz de Santos, Madrid.
- WARDLAW GM (2008). Perspectivas sobre Nutrición, Ed. Paidotribo, Badalona.

- FOOD SCIENCE

- FEHLEBER K (1998). Higiene Veterinaria De Los Alimentos. Ed. Acribia. Zaragoza.XXXX.
- ORDOÑEZ JA (ed) (1998). Tecnología de los alimentos (2 tomos). Ed. Síntesis. Madrid.
- POTTER NN, HOTCHKISS JH (1999). Ciencia de los Alimentos. Ed. Acribia. Zaragoza.
- PRIMO YUFERA E (1998). Química de los Alimentos. Ed. Síntesis. Madrid.
- ROBINSON DS (1991). Bioquímica y valor nutritivo de los alimentos. Ed. Acribia. Zaragoza.
- VOLLMER G, JOOS G, SCHENKER D, STURM W, VREDEN N. (1999). Elementos de Bromatología descriptiva. Ed. Acribia. Zaragoza.
- WONG DWS (1994). Química de los alimentos. Mecanismos y teoría. Ed. Acribia. Zaragoza.
- CAMEAN AM, REPETTO M (2006). Toxicología alimentaria. Ed. Díaz de Santos. Madrid.

RECOMMENDED INTERNET LINKS

- Dietary Reference Intakes (DRIs): http://fnic.nal.usda.gov/nal_display/index.php?info_center=4&tax_level=1
- United Nations Organization for Agriculture and Food. http://www.fao.org/index_es.htm



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- Spanish Agency for Food Safety and Nutrition: www.aesan.msc.es
 - Spanish Federation of Societies of nutrition, food and dietary. <http://www.fesnad.org/>
 - Ministry of Environment and Rural and Marine Area: <http://www.marm.es/>

