



IDENTIFYING DATA

Food hygiene

Subject	Food hygiene			
Code	001G041V01604			
Study programme	Grado en Ciencia y Tecnología de los Alimentos			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	3rd	2nd
Teaching language	#EnglishFriendly Spanish Galician			
Department				
Coordinator	Carballo Rodríguez, Julia			
Lecturers	Carballo Rodríguez, Julia			
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Web				
General description	<p>The objects of study of this subject are the microorganisms, parasites, viruses and other food-borne agents and the problems they cause (food degradation and food-borne diseases). How to detect and prevent the presence of these agents in foods will be also learned. It studies also the microbial ecology foods. English Friendly subject: International students may request from the teachers: a) resources and bibliographic references in English, b) tutoring sessions in English, c) exams and assessments in English.</p>			

Training and Learning Results

Code	
A2	Students will be able to apply their knowledge and skills in their professional practice or vocation and they will show they have the required expertise through the construction and discussion of arguments and the resolution of problems within the relevant area of study.
B2	Students will acquire and put teamwork skills and abilities into practice, whether these have multidisciplinary character or not, in both national and international contexts, becoming familiar with a diversity of perspectives, schools of thought and practical procedures.
B3	Students will develop personal skills to engage in critical thinking.
B4	Students will be able to adapt to new situations, become highly creative and have ideas to take up leadership positions.
B5	Students will be able to take the initiative and acquire entrepreneurship skills, with a special focus on improving the quality of life.
C7	To be familiar with the basic concepts linked to hygiene through the whole process of production, transformation, preservation and distribution of food. This involves the acquisition of the relevant knowledge about food microbiology, parasitology and toxicology, as well as contents linked to personal hygiene, products and processes.
C8	To be familiar with the systems of food quality, along with all the aspects linked to food regulation and legislation.
C10	To be familiar with the systems of environmental management linked to the production processes of the food industry.
C13	Ability to analyze food.
C14	Ability to control and optimize processes and products.
C17	Ability to analyze and assess food risks.
C18	Ability to manage food safety.
C19	Ability to assess, control and manage food quality.
C20	Ability to implement quality systems in the food industry.
D1	Analysis, organization and planning skills.
D3	Ability to communicate, both orally and in writing, in local and foreign languages.
D8	Critical and self-critical thinking skills.
D10	Conflict-resolution and negotiation skills.
D11	Striving for quality with focus on awareness about environmental issues.

Expected results from this subject

Expected results from this subject

Training and Learning Results

The student will obtain knowledge about the microorganisms, parasites, viruses and other food-borne agents and about the problems they cause (food degradation and food-borne diseases). The detection and prevention of their presence in foods will be also learned.	A2	B2	C7	D1
		B3	C8	D3
		B4	C10	D8
		B5	C13	D10
			C14	D11
			C17	
			C18	
			C19	
			C20	

Contents

Topic	
SECTION I. MICROORGANISMS AND FOODS	Lesson 1. Relationship microorganisms-food
SECTION I. MICROORGANISMS AND FOODS	Lesson 2. Origin of food-borne microorganisms
SECTION I. MICROORGANISMS AND FOODS	Lesson 3. Factors affecting the growth and survival of microorganisms in foods
SECTION I. MICROORGANISMS AND FOODS	Lesson 4. Food preservation
SECTION II. METHODS FOR MICROBIOLOGICAL ANALYSIS OF FOODS	Lesson 5. Analytical techniques
SECTION II. METHODS FOR MICROBIOLOGICAL ANALYSIS OF FOODS	Lesson 6. Microbiological markers: index and indicator microorganisms
SECTION III. BACTERIA CAUSING FOOD-BORNE DISEASES	Lesson 7. Salmonella
SECTION III. BACTERIA CAUSING FOOD-BORNE DISEASES	Lesson 8. Shigella
SECTION III. BACTERIA CAUSING FOOD-BORNE DISEASES	Lesson 9. Escherichia coli
SECTION III. BACTERIA CAUSING FOOD-BORNE DISEASES	Lesson 10. Yersinia enterocolitica
SECTION III. BACTERIA CAUSING FOOD-BORNE DISEASES	Lesson 11. Campylobacter
SECTION III. BACTERIA CAUSING FOOD-BORNE DISEASES	Lesson 12. Vibrio (V. parahaemolyticus, V.cholerae, V. vulnificus)
SECTION III. BACTERIA CAUSING FOOD-BORNE DISEASES	Lesson 13. Aeromonas e Plesiomonas
SECTION III. BACTERIA CAUSING FOOD-BORNE DISEASES	Lesson 14. Brucella
SECTION III. BACTERIA CAUSING FOOD-BORNE DISEASES	Lesson 15. Staphylococcus aureus
SECTION III. BACTERIA CAUSING FOOD-BORNE DISEASES	Lesson 16. Bacillus cereus
SECTION III. BACTERIA CAUSING FOOD-BORNE DISEASES	Lesson 17. Clostridium botulinum
SECTION III. BACTERIA CAUSING FOOD-BORNE DISEASES	Lesson 18. Clostridium perfringens
SECTION III. BACTERIA CAUSING FOOD-BORNE DISEASES	Lesson 19. Listeria monocytogenes
SECTION III. BACTERIA CAUSING FOOD-BORNE DISEASES	Lesson 20. Other food-borne pathogenic bacteria
SECTION IV. NON BACTERIAL AGENTS CAUSING FOOD-BORNE DISEASES	Lesson 21. Toxins producing fungi
SECTION IV. NON BACTERIAL AGENTS CAUSING FOOD-BORNE DISEASES	Lesson 22. Toxins producing algae and cyanobacteria
SECTION IV. NON BACTERIAL AGENTS CAUSING FOOD-BORNE DISEASES	Lesson 23. Food-borne viruses. Prions
SECTION IV. NON BACTERIAL AGENTS CAUSING FOOD-BORNE DISEASES	Lesson 24. Food-borne parasites
SECTION V. MICROBIOLOGICAL QUALITY CONTROL	Lesson 25. Microbiological quality control of foods
SECTION VI. MICROBIAL ECOLOGY OF FOODS	Lesson 26. Meat and meat products
SECTION VI. MICROBIAL ECOLOGY OF FOODS	Lesson 27. Fish, shellfish and their products
SECTION VI. MICROBIAL ECOLOGY OF FOODS	Lesson 28. Milk and dairy products
SECTION VI. MICROBIAL ECOLOGY OF FOODS	Lesson 29. Eggs and egg products
SECTION VI. MICROBIAL ECOLOGY OF FOODS	Lesson 30. Nuts, cereals, fruits and vegetable products

SECTION VI. MICROBIAL ECOLOGY OF FOODS
LABORATORY PRACTICES

Lesson 31. Canned food, fermented products and ready to eat foods

1. Detection and counting Enterobacteriaceae lactose-positive (coliforms) and Escherichia coli in cheese.
2. Detection and counting enterococi en cheese.
3. Counting mesophiles in cheese.
4. Investigation of Salmonella in eggs.
5. Investigation of Vibrio parahaemolyticus in seashells.
6. Investigation of Staphylococcus aureus in custard cream.

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	27	29	56
Seminars	14	19	33
Laboratory practical	14	6	20
Learning-Service	0	8	8
Practices through ICT	0	32	32
Introductory activities	1	0	1

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Lecturing	Lectures of 50 minutes with visual support will address the study of the sections I, II, IV and V collected in the Contents of this Guide. It is asked to the students to review, in advance, the documentation deposited in the distance learning platform in order to promote their participation and progress. The teacher produces questionnaires of self-assessment that will be available online in the distance learning platform. Answering the questionnaires is not compulsory, but its use is taken into account for final marks.
Seminars	The seminars are devoted to the study the sections III and VI collected in the Contents of this Guide. It is asked to the students to produce and present a piece of work about one of the corresponding subjects of these sections. They also have to propose two questions about their subjects. From all those questions, the teacher elaborates questionnaires of self-assessment that will be the available online in distance learning platform. As in the previous case, answer the questionnaires is not compulsory, but taken into account for final marks. The students have to upload their assignments in the distance learning platform in the Exercise created to that effect.
Laboratory practical	The studentes will carry out microbiological analyses of real foods, contaminated on purpose to obtain results that can be discussed. Assistance to laboratoy sessions is compulsory.
Learning-Service	It is offered to the students to participate voluntarily in the Program MicroMundo@UVigo dedicated to the search for new antibiotics-producing microorganisms and to the diffusion of the problem of the antibiotic resistance and of the need for their rational use.
Practices through ICT	The students can carry out the following voluntary activities: - See and/or download documentation from the distance learning platform - Visit complemetary websites - Answer the questionnaires deposited in the distance learning platform - Deposit news, videos... related with the microbiology and hygiene of foods in the Exercises created in the distance learning platform - Create, in the distance learning platform, forums of discussion and/or participate in the ones created by other users
Introductory activities	The first session is dedicated to establish the working rules and to organize the activities to be done, which are the collected in the present Guide.

Personalized assistance

Methodologies	Description
Introductory activities	The students will have personalised attention whenever they need it and require
Lecturing	The students will have personalised attention whenever they need it and require
Seminars	The students will have personalised attention whenever they need it and require
Laboratory practical	The students will have personalised attention whenever they need it and require
Learning-Service	The students will have personalised attention whenever they need it and require
Practices through ICT	The students will have personalised attention whenever they need it and require

Assessment						
	Description	Qualification	Training and Learning Results			
Lecturing	An exam of short and long questions will be used to evaluate the competencies related to the contents of the program addressed in the different activities. It is necessary to obtain a minimum qualification of 3 (out of 10) in the exam to take into account the other activities done.	40	A2	B3	C7 C8 C14 C17 C18 C19 C20	D1 D3
Seminars	The presentation and defence of the monographic work elaborated by the students is scored as well as the fulfillment of the activities indicated in methodology. Alternatively the participation en the learning-service Programm MicroMundo@UVigo will be evaluated.	20			C7 C8 C10 C13 C14 C17 C18 C19 C20	
Laboratory practical	The evaluation of laboratory work is based on continuous follow-up of the activities that the students carry out in the laboratory.	20		B2 B3 B4 B5	C13 C14 C17 C18 C19 C20	
Practices through ICT	Each new or video sent and commented is scored with 0,25 points (till a maximum of 3 news or videos). Each relevant comment in the forums is scored 0,1 points (till a maximum of 10 participations). The use of questionnaires in the distance learning platform is scored 0,25 points.	20	A2	B3	C7 C8 C10 C14 C17 C18 C19 C20	D1 D3 D8 D11

Other comments on the Evaluation

The students who do not participate in the activities proposed have to make a final exam and need to score at least 5 (on 10) to pass.

The exam dates approved for the academic year 2022-2023 are:

1ª edición: Abril 4th, 2024

2ª edición: July 11th, 2024

In case of error in the transcription of these dates, the ones approved officially and published in the announcements board and in the web of the Facultade de Ciencias will prevail.

Sources of information

Basic Bibliography

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- Doyle, M.P., Beuchat, L.R., Montville, T.J., **Microbiología de los alimentos. Fundamentos y fronteras**, Acribia, 2001
- Forsythe, S.J., Hayes, P.R., **Higiene de los alimentos, Microbiología y HACCP**, 2ª, Acribia, 2002
- Forsythe, S.J., **Alimentos seguros. Microbiología**, Acribia, 2003
- Hobbs, B.C., Gilbert, R.J., **Higiene y toxicología de los alimentos**, 4ª, Acribia, 1996
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Jay, J.M., Loessner, M.J., Golden, D.A., **Microbiología moderna de los alimentos**, 5ª, Acribia, 2009

Koopmans, M.P.G., Cliver, D.O., Bosch, A., **Virus de transmisión alimentaria: avances y retos**, Acribia, 2010

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Montville, T.J., Matthews, K.R., **Microbiología de los alimentos: introducción**, Acribia, 2009

Mossel, D.A.A., Moreno, B., Struijk, C.B., **Microbiología de los alimentos: fundamentos ecológicos para garantizar y comprobar la inocuidad y la calidad de los alimentos**, 2ª, Acribia, 2002

Pascual Anderson, M.R., Calderón y Pascual, V., **Microbiología alimentaria: metodología analítica para alimentos y bebidas**, 2ª, Díaz de Santos, 2000

Pascual Anderson, M.R., **Enfermedades de origen alimentario: su prevención**, Díaz de Santos, 2005

Ray, B., Bhunia, A., **Fundamentos de microbiología de los alimentos**, 4ª, McGraw-Hill Interamericana, 2010

Hernández Urzúa, M.A., **Microbiología de los alimentos: fundamentos y aplicaciones en ciencias de la salud**, Editorial Médica Panamericana, 2016

Complementary Bibliography

Recommendations

Subjects that it is recommended to have taken before

Microbiology/O01G041V01401

Other comments

There is an english version of many of the books indicated in the section "Sources if information" available in the library of the Campus of Ourense
