

**Multidisciplinary Application of One Health in  
Food-Borne Zoonoses and Food Safety and Security**

Code: 43759  
ECTS Credits: 6

Degree	Type	Year	Semester
4315915 Zoonoses and One Health	OB	0	2

## Contact

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## Other comments on languages

100%

## Use of Languages

Principal working language: english (eng)

## Teachers

Maria dels Àngels Calvo Torras

Emilio-Ignacio López Sabater

Carolina Ripollés Àvila

Francesc Accensi Alemany

Ignasi Garrido Castañe

## Prerequisites

As a requirement for admission, students must be in possession of one of the grades listed below:

Graduates in the field of Health Sciences (Veterinary Medicine, Nursing, Pharmacy, Food Science and Technology, Animal Science and Health, Biomedicine, Psychology ...) and Life Sciences (Biology, Biochemistry, Biotechnology, Zoology, Botany, Ecology, Biodiversity, Environmental Sciences, Agronomic Engineering, Forestry ...) or equivalent

## Objectives and Contextualisation

The main objective of this module is that students were able to perform the risk assessment of the presence of zoonotic agents, and other pathogens, in foodstuffs. Following the basis of risk analysis in its three components: evaluation, management and communication, the theoretical-practical sessions will introduce the main zoonotic agents that are foodborne, analyzing what are their reservoirs, most likely ways of contamination and its incidence in different types of food. The main policies developed in Spain, Europe and worldwide to guarantee food safety will be also described, especially in relation to the control of the incidence of foodborne diseases caused by zoonotic agents. In order to perform risk assessments, both from the perspective of public health management agencies and from the perspective of the food industry, factors that affect the survival and evolution of zoonotic agents during food processing will be also evaluated.

## Competences

- Act in accordance with the code of ethics of the profession.
- Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
- Continue the learning process, to a large extent autonomously.
- Detect the zoonoses that could affect food safety, identifying critical areas and drawing up plans for prevention or control.
- Display understanding and familiarity with using the methodologies and tools of zoonotic risk assessment based on the concept of One Health.
- Identify the principles behind the concept of food safety and security and apply them, following the precepts of the vision of One Health.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Work alone or in a multidisciplinary team within the area of study, showing critical reasoning and creativity, and the ability to analyse, interpret and synthesise the data generated.

## Learning Outcomes

1. Comply with the profession's code of practice in all contexts of food safety.
2. Describe the diseases caused by zoonotic agents, their pathogenesis, their most common symptoms and their seriousness.
3. Determine the most common sources of contamination and the factors that affect their survival and growth in foods.
4. Draw up prevention and control plans for application to food safety.
5. Draw up reports on the cases formulated that are detailed, accurate and well written.
6. Enumerate the principal zoonotic agents that are mainly transmitted to humans by food consumption.
7. Evaluate suitable policies to reduce food wastage.
8. Explain and defend conclusions before a specialist audience.
9. Formulate the most suitable control measures to minimise risk from food-transmitted zoonotic agents.
10. Identify the population groups that are most sensitive to zoonotic agents.
11. Know and distinguish between the concepts of food safety in One Health: security and safety.
12. Know the factors that determine food safety and the public and private initiatives that aim to ensure it.
13. Know the planning and logistics needed in food production systems to ensure their safety.
14. Obtain suitable bibliographic information to make risk assessments for food-transmitted zoonotic agents.
15. Perform a risk assessment from the perspective of the bodies responsible for the management of public health and the food industry.
16. Predict the evolution of health risks during the technological treatments applied to foods and during their shelf life.
17. Use tertiary predictive models to assess the risks related to the presence of zoonotic agents in foods.
18. Work alone or in a multidisciplinary team within the area of study, showing critical reasoning and creativity, and the ability to analyse, interpret and synthesise the data generated.

## Content

- The global concept of food safety under the principle of One Health.
- The management and communication of risk policies in food safety.
- Impact of foodborne zoonoses at the Spanish, European and worldwide level.
- Bacteria that cause foodborne zoonoses.
- Foodborne zoonoses caused by parasites.
- Other foodborne agents: Viruses, prions, mycotoxins
- Other non-zoonotic foodborne pathogens.
- Effect of technological treatments and food preservation on the viability of pathogenic micro-organisms: effects on the shelf life of foodstuffs.

## Methodology

Attendance based:

- Theoretical classes
- Workshops: case resolution classes
- Laboratory practical classes
- Tutorials

Autonomous:

- Reading articles / reports of interest
- Resolution of practical cases

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Practical classes (Laboratory)	8	0.32	12, 5, 4, 9, 16
Seminars	14	0.56	11, 13, 7
Theoretical classes	31	1.24	1, 12, 2, 3, 4, 6, 10, 9, 15
Workshops	2	0.08	5, 14, 16, 15, 17
Type: Supervised			
Tutorials	18	0.72	1, 12, 2, 3, 5, 4, 6, 10, 14, 9, 16, 15, 18, 17
Type: Autonomous			
Individual-Group study	75	3	1, 12, 11, 13, 2, 3, 4, 6, 10, 14, 9, 16, 15, 18, 17, 7

## Assessment

Requirements to approve the module:

- To attend a minimum of 80% of attendance-based activities
- To obtain at least a grade of 4 out of 10 in each of the assessable activities
- To obtain at least an average grade of 5 out of 10 once considered all the assessable activities

Once these requirements are met, the final grade will be obtained using the following criteria:

- Cases resolution and self-learning activities: 60% of the final mark
- Exam: 40% of the final grade

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Exam	40	2	0.08	1, 12, 11, 13, 2, 3, 4, 6, 10, 9, 16, 15, 17, 7

## Bibliography

- Losada Manosalvas, S. (2001). La gestión de la seguridad alimentaria. Barcelona: Ariel.
- Luning, P. A., Devlieghere, F., & Verhé, R. (2006). Safety in the agri-food chain. Wageningen: Wageningen Academic.
- Mortimore, S., & Wallace, C. (2001). HACCP :Enfoque práctico (2ª ed.). Zaragoza: Acribia.
- Mostert, M. A., Holah, J., & Lelieveld, H. L. M. (2005). Handbook of hygiene control in the food industry. Boca Raton etc.: Crc.
- Puig-Durán Fresco, J. (1999). Ingeniería, autocontrol y auditoría de la higiene en la industria alimentaria. Bilbao: A. Madrid Vicente Ediciones.
- Tothill, I. E. (2003). Rapid and on-line instrumentation for food quality assurance. Cambridge, England: Woodhead.
- Vasconcellos, J. A. (2004). Quality assurance for the food industry :A practical approach. Boca Raton, Fla.: CRC Press.
- Wildbrett, G. (2000). Limpieza y desinfección en la industria alimentaria. Zaragoza: Acribia.
- OMS sobre seguretat alimentaria: <http://www.who.int/fsf>
- Servei de seguretat i inspecció alimentària de la USDA americana: <http://www.fsis.usda.gov/>
- International Food Safety Council: <http://www.foodsafetycouncil.org/>
- FDA (Food and Drug Administration) : <http://www.fda.gov/Food/default.htm>
- Codex Alimentarius: <http://www.codexalimentarius.net>
- Autoridad Europea de Seguridad Alimentaria: <http://www.efsa.eu.int>
- Agencia Española de Seguridad Alimentaria y Nutrición: <http://www.aesan.msc.es>
- Agència catalana de Seguretat Alimentària: <http://www.gencat.cat/salut/acsa/>
- Food Safety Agency: <http://www.food.gov.uk/>
- La seguridad alimentaria en Europa: [http://ec.europa.eu/food/food/index\\_es.ht](http://ec.europa.eu/food/food/index_es.ht)

## Software

ComBase (<https://www.combase.cc/index.php/en/>)

MicroHibro (<https://www.microhibro.com/>)