

## Quality, Innovation and Emerging Processing Technologies

2014/2015

Code: 43035

ECTS Credits: 9

Degree	Type	Year	Semester
4313796 Qualitat d'Aliments d'Origen Animal	OB	0	2

### Contact

Name: Antonio José Trujillo Mesa

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### Use of languages

Principal working language: espanyol (spa)

Some groups entirely in English: No

Some groups entirely in Catalan: Yes

Some groups entirely in Spanish: No

### Teachers

Victoria Ferragut Pérez

María Manuela Hernández Herrero

Montserrat Mor-Mur Francesch

Reyes Pla Soler

José Juan Rodríguez Jerez

Artur Xavier Roig Sagués

Manuel Castillo Zambudio

Jordi Saldo Periago

Maria Montserrat Riba Sicart

### External teachers

Javier del Campo

José Salas Vicente

Sònia Guri

### Prerequisites

This module does not have any requirements.

### Objectives and Contextualisation

In this module students will learn the different key stages in the innovation process and design of a new product of animal origin. They will also know the most innovative processing technologies; its validation and they will study the parameters of the process that have the greatest impact on the characteristics of the final product. Among the technologies that reduce the environmental impact of the food industry, students will study the use of products for the preparation of functional ingredients.

## Skills

- Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
- Design new foods by incorporating the necessary ingredients and additives and by applying appropriate processing and conservation technologies.
- Design, organise and execute projects related to this field of study, working alone or in a multidisciplinary or interdisciplinary team, displaying a critical sense and creativity, and the ability to analyse, synthesise and interpret information.
- Evaluate the potential of a technological process to obtain the microbiological, physical, chemical, sensorial and nutritional properties that determine the quality of a food.
- Execute and manage an innovation process on a food product, or a production and conservation process.
- Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
- Search for information using the appropriate channels and use this information to solve problems in the work context.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.

## Learning outcomes

1. Carry out a bibliographic search.
2. Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
3. Identify regional, national and international regulations.
4. Identify scientifically sound information sources.
5. Identify the differential characteristics of the innovation project.
6. Identify the potential of food industry by-products as sources of functional ingredients.
7. Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
8. Know the parameters that determine product quality in a process of food transformation or conservation
9. Make proposals for addressing specific practical problems.
10. Obtain the parameters of a quantitative model that describes the changes caused by technological processing to the properties of a food.
11. Prepare flowcharts, diagrams, tables and/or figures.
12. Present work done in seminars, leading the discussion of problem areas
13. Present work done in seminars, leading the discussion of problem areas.
14. Recognise the capacities of each different food processing and conservation technology, especially those of emerging technologies.
15. Recommend the appropriate technology for preparing innovative foods.
16. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
17. Use mathematical models to predict the effect of processing on the characteristics of a food.
18. Use tools for managing and documenting the innovation process.

## Content

- New technologies for processing and preserving

High pressure

Electrical pulses

High pressure homogenization

Active packaging

#### UV radiation

- Validation of technological treatments to ensure food quality
- Innovation Management
- New products design

#### Foods with nutrition and health claims

#### Recovery of traditional products

#### Collective restoration

- Recovery of raw materials devalued and sub products of food industry.

## Methodology

- Lectures / expository classes
- Seminars
- Problem-based Learning
- Debates
- Tutoring
- Lab / Pilot Plant
- Reporting / coursework
- Reading articles / reports of interest
- Lecture / oral presentation of work

## Activities

Title	Hours	ECTS	Learning outcomes
Type: Directed			
Participative lectures	42	1.68	8, 9, 6, 5, 10, 7, 16, 15, 14, 18, 17
Pilot plant practices	9	0.36	9, 6, 11, 7, 16, 14
Presentation/Oral presentations	14	0.56	11, 12, 13, 2
Seminars	4	0.16	4, 1, 10, 11, 13, 7, 16, 2, 17
Type: Supervised			
Learning based on problem-solving	10	0.4	8, 4, 9, 1, 6, 5, 3, 10, 11, 12, 13, 7, 16, 2, 15, 14, 18, 17
Unprogrammed tutoring	15	0.6	8, 4, 9, 6, 5, 10, 12, 7, 2, 15, 14, 18, 17
Type: Autonomous			
Reading articles and reports of interest	70	2.8	8, 4, 1, 6, 5, 3, 10, 11, 7, 15, 14, 18, 17
Reporting	59	2.36	8, 4, 9, 1, 6, 5, 3, 10, 11, 12, 13, 7, 16, 15, 14, 18, 17

## Evaluation

- Lectures / expository classes
- Seminars

- Problem-based Learning
- Debates
- Tutoring
- Lab / Pilot Plant
- Reporting / coursework
- Reading articles / reports of interest
- Lecture / oral presentation of work

## Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Delivery of problems and written exercises	Weighted with the associated topics	1	0.04	8, 4, 9, 1, 6, 5, 3, 10, 11, 12, 13, 7, 16, 2, 15, 14, 18, 17
Presentations	Weighted with the associated topics	1	0.04	8, 4, 9, 1, 6, 5, 3, 10, 11, 12, 13, 7, 16, 2, 15, 14, 18, 17

## Bibliography

Ahvenainen, Raija (2003). Novel Food Packaging Techniques. Woodhead Publishing. Online version available at: [http://www.knovel.com/web/portal/browse/display?\\_EXT\\_KNOVEL\\_DISPLAY\\_bookid=914&VerticalID=0](http://www.knovel.com/web/portal/browse/display?_EXT_KNOVEL_DISPLAY_bookid=914&VerticalID=0)

Baldwin, Cheryl (2009). Sustainability in the Food Industry. John Wiley & Sons. Online version available at: [http://www.knovel.com/web/portal/browse/display?\\_EXT\\_KNOVEL\\_DISPLAY\\_bookid=5063&VerticalID=0](http://www.knovel.com/web/portal/browse/display?_EXT_KNOVEL_DISPLAY_bookid=5063&VerticalID=0)

Breivik, H. (2007). Long-Chain Omega-3 Specialty Oils. Breivik, Harald (2007). Woodhead Publishing. Online version at: [http://app.knovel.com/web/toc.v/cid:kpLCOSO002/viewerType:toc/root\\_slug:long-chain-omega-3-specialty-oils](http://app.knovel.com/web/toc.v/cid:kpLCOSO002/viewerType:toc/root_slug:long-chain-omega-3-specialty-oils)

Campus, M. (2010). High Pressure Processing of Meat, Meat Products and Seafood. Food Eng. Rev. 2, 256-273.

Decker, E.A.; Elias, R.J.; McClements, D.J. (2010). Oxidation in Foods and Beverages and Antioxidant Applications, Volume 2 - Management in Different Industry Sectors. Woodhead Publishing. Online version at: [http://app.knovel.com/web/toc.v/cid:kpOFBAVMK/viewerType:toc/root\\_slug:oxidation-in-foods-beverages/url\\_sl](http://app.knovel.com/web/toc.v/cid:kpOFBAVMK/viewerType:toc/root_slug:oxidation-in-foods-beverages/url_sl)

Donsì, F., Ferrari, G. and Maresca, P. (2009). High-Pressure Homogenization for Food Sanitization. Global Issues in Food Science and Technology. Elsevier

Donsì, F., Annunziata, M. and Ferrari, G. (2013). Microbial inactivation by high pressure homogenization: Effect of the disruption valve geometry. Journal of Food Engineering, 115, 362-370

Doona, Christopher J.; Kustin, Kenneth; Feeherry, Florence E. (2010). CaseStudies in Novel Food Processing Technologies - Innovations in Processing, Packaging and Predictive Modelling. Woodhead Publishing. Online version available at: [http://www.knovel.com/web/portal/browse/display?\\_EXT\\_KNOVEL\\_DISPLAY\\_bookid=3882&VerticalID=0](http://www.knovel.com/web/portal/browse/display?_EXT_KNOVEL_DISPLAY_bookid=3882&VerticalID=0)

Dumay, E., Chevalier-Lucia, D., Picart-Palmade, L., Benzaria, A., Gràcia-Julià, A., & Blayo, C. (2013). Technological aspects and potential applications of (ultra) high-pressure homogenisation. Trends in FoodScience & Technology,31(1), 13-26.

Kelly, A. L., Kothari, K. I., Voigt, D. D. (2009). Improving technological and functional properties of milk by high-pressure processing. En: Dairy Derived Ingredients - Food and Nutraceutical Uses. Ed.: Corredig, M. Woodhead Publishing. Online version at: [http://app.knovel.com/web/view/swf/show.v/rcid:kpDDIFNU02/cid:kt007AZMD1/viewerType:pdf/root\\_slug:dairy-d](http://app.knovel.com/web/view/swf/show.v/rcid:kpDDIFNU02/cid:kt007AZMD1/viewerType:pdf/root_slug:dairy-d)

Martin, R.E., Carter, E.P., Flick, G.J., Davis, L.M. (2000). Marine & freshwater products handbook, CRC Press.

Medina-Meza, I.G., Barnaba, C., Barbosa-Cánovas, G.V. (2014). Effects of high pressure processing on lipid oxidation: A review. *Innovative Food Science and Emerging Technologies* 22, 1-10.

Peter W.B. Phillips, Jeremy Karwandy, Graeme Webb and Camille D. Ryan (2012). *Innovation in Agri-food Clusters. Theory and Case Studies*. CABI. Online version available at:  
<https://xpv.uab.cat/cabebooks/FullTextPDF/2012/,DanaInfo=.awxyCgfhpHx1r+20123378738.pdf>

Rendueles, E., Omer, M.K., Alvseike, O., Alonso-Calleja, C., Capita, R., Prieto, M. (2011). Microbiological food safety assessment of high hydrostatic pressure processing: A review. *LWT - Food Science and Technology* 44, 1251-1260.