Universitat Autònoma de Barcelona

2017/2018

Improving the Quality of Food From the Food Industry

Code: 43033
ECTS Credits: 9

Degree	Type	Year	Semester
4313796 Quality of Food of Animal Origin	OB	0	1

Contact

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Use of languages

Principal working language: spanish (spa)

Teachers

Marta Capellas Puig

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Prerequisites

Although no pre-requirements are needed, it's recommended to have a general knowledge of processes in the food industry, chemistry of food, and food composition.

Objectives and Contextualisation

To establish criteria for proper food processing to ensure its quality, taking into account all stages until the food reaches the consumer.

To study conventional processes applied in the agri-food industry to products of animal origin, referred to the quality module from the farm as well as their derivatives. It involves using appropriate criteria to the characteristics of processed food consumption and identifying relevant issues that affect and determine their quality at different stages of the process, from previous treatments until the product reaches the consumer. It's also included the study of different aspects that affect and guarantee product quality such as composition, physical, chemical, biochemical and microbiological properties as well as the proper use of additives.

Skills

- Continue the learning process, to a large extent autonomously.
- Design, organise and execute projects related to this field of study, working alone or in a unidisciplinary or multidisciplinary team, displaying a critical sense and creativity, and the ability to analyse, synthesise and interpret information.
- Distinguish the quality parameters of fresh and processed foods in accordance with their standards.

- Establish appropriate processes for maintaining or improving the quality of fresh and processed foods in accordance with their quality standards.
- 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.

Learning outcomes

1. Choose the correct packaging and storage conditions for the product until it is consumed.
2. Choose the most important quality-control parameters for the process and the final product and the parameters for determining the food's shelf life.
3. Continue the learning process, to a large extent autonomously.
4. Decide on ingredients to use, and identify their functions.
5. Describe the stages of food production, identifying their impact on the overall process and on the characteristics of the final product.
6. Establish the essential quality parameters for defining quality.
7. Identify the modifications that can take place during the processing and storage of the product.
8. Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
9. Present one's own work or discussions arising from the different courses within the module, in oral and/or written form and following scientific and technical criteria.
10. Relate the composition of a food to its characteristics.
11. Use scientific and technological criteria when choosing treatments to be applied.
12. Use search tools correctly when completing the activities in the module, and show that the information found has been used, interpreted and integrated.

Content

1. Milk and milk products:

- Milk: Influence of pre-treatments on milk quality and on its derivatives. Effects of heat treatments on the quality of milk and derived products.

- Yogurt and fermented milks: Milk initial quality for yogurt and fermented milks. Process influence on the quality of the final product. Use of microbial cultures to improve the quality. Defects in yogurts and fermented milks.

- Cheese: Initial quality of milk for cheese making. Procesing of cheeses and their influence on the final product quality. Cheeses defects.

- Other dairy products: cream, ice cream, butter, milk powder, condensed milk.

2. Meat and meat products:

- Fresh meat Quality: strategies in slaughterhouse and cutting rooms. Health quality, organoleptic and shelf life.

- Injected Meat: differentiation between legislation, organoleptic and nutritional quality. Ingredients and additives by function. Industrial yield.

- Restructured meat: applicable technologies, ingredients and additives used. Potential of composition tailor-made meats.

- Quality of heat-treated meat products according to business objectives: desirable properties of raw materials and product evolution over the years.

- Quality of fermented meat products according to business goals: desirable properties of raw materials and product evolution over the years.

3. Fish and Fishery Products

- Optimizing of the Processing of Fishery Products: Quality and Benefits.

- Evaluation of the quality of fish and processed products: Recent contributions.

4. Eggs and derived products.

- Quality assessment: current non destructive methodologies applicable to shell eggs and egg products.

Methodology

The methodology of the module will be based on lectures, labs, and conferences by professionals of the food industry; seminars and presentations of works by students by means of shelf learning:

Milk and milk products:

- Lectures: general introduction and quality control of milk, yogurt and fermented milk and cheese.

- Quality control in the dairy industry producer of pasteurized / sterilized milk: seminar / conference conference by professionals.

- Influence of production factors in yoghurt quality and quality control of finished product: lab.

- Influence of coagulating milk and whey from the curds in cheese quality: lab.

- Quality control of cheese: lab.

- Quality of ice creams: lecture by professional.

- Self-learning: students, in small groups (2-3 people), will study the main effects that determine the quality of dairy products by means of an oral presentation.

Meat and meat products

- Lectures: general introduction to all topics.

- Self learning: students, in small groups (2-3 people), will study in depth one of the proposed topics.

- Lab: use of additives in meat products and their influence on the final quality.

Fish and fishery products

- Lectures: raw and processed fish products material.

- Lab: relationship between raw materials and treatments on quality.

- Quality control in the fishing industry: conference by an industry professional.

Eggs and egg products

- Lectures: Egg and egg products processing.

- Lab: Quality of raw material: assessment methods.

- The quality of egg production: speech by an industry professional of the trade.

Activities

Title	Hours	ECTS	Learning outcomes

Type: Directed			
Laboratory	21	0.84	6, 7, 8, 3, 10, 2
Lectures	26	1.04	4, 5, 6, 7, 8, 10, 11, 2, 1
Seminars and conferences	20	0.8	8
Type: Supervised			
Supervised work	32	1.28	4, 12, 5, 6, 7, 9, 8, 3, 10, 11, 2, 1
Type: Autonomous			
Bibliographic work and autonomous study	126	5.04	4, 12, 5, 6, 7, 9, 8, 3, 10, 11, 2, 1

Evaluation

The competences of this module will be assessed by the different topics included (dairy, meat, fish and eggs):

- Dairy products: 40% attendance to the theoretical and practical sessions and 60% self-learning.
- Meat and meat products: a) 40% attendance at lectures and practical sessions; b) 40% self-study work; c) 20% questions about the self-learning work. Note b) marks will be set by the teacher and peers.
- Fish and derivative products: presentation based on a research paper in English. In pairs. Marks will be set by the teacher and peers.

- Eggs and egg products: presentation based on a research paper in English. In pairs. Marks will be set by the teacher and peers.

The final qualification is the weighted average number considering the load of the different topics in the module.

Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Attendance	50%	0	0	4, 12, 5, 6, 7, 9, 8, 3, 10, 11, 2, 1
Self learning	50%	0	0	4, 5, 6, 7, 8, 3, 10, 11, 2, 1

Bibliography

Milk and dairy products:

BRITZ, T. J., ROBINSON, R. K. (2008). Advanced Dairy Science and Technology. John Wiley & Sons, New York, USA.

CHANDAN, R. C.; KILARA, A., SHAH, N.P. (2008). Dairy Processing and Quality Assurance. John Wiley & Sons, New York, USA.

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FOX, P.F. (2004). Cheese: chemistry, physics and microbiology. Vol. 1. General aspects. Vol. 2. Major cheese groups. Elsevier Academics, Amsterdam.

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RICHARDSON, P. (2001). Improving the Thermal Processing of Foods. Woodhead Publishing, Cambridge, UK.

RICHARDSON, P. (2001). Thermal Technologies in Food Processing. Woodhead Publishing, Cambridge, UK.

ROBINSON, R., WILBEY, R. (2002). Fabricación de queso. Acribia, Zaragoza.

ROGINSKI, H., FUQUAY, J.W., FOX, P.F. (2002). Encyclopedia of dairy sciences. Academic Press, Londres.

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TAMINE, A. Y. (2009). Dairy Fats and Related Products. John Wiley & Sons, New York, USA.

TAMINE, A. Y. (2009). Dairy Powders and Concentrated Products. John Wiley & Sons, New York, USA.

TAMINE, A. Y. (2009). Milk Processing and Quality Management. John Wiley & Sons, New York, USA.

TAMINE, A.Y., ROBINSON, R.K. (2007). Yogur: science and technology. Woodhead, Cambridge.

WALSTRA, P., GEURTS, T.J., NOOMEN, A., JELLMA, A., Van BOEDEL, M. (2001). Ciencia de la leche y tecnología de los productos lácteos. Editorial Acribia, Zaragoza.

WEHR, H.M., FRANK, J.F. (2004). Standard methods for the examination of dairy products. American Public Health Association, Washington, USA

Electronic resources:

Libros electrónicos http://www.knovel.com/web/portal/browse/subject/60/filter/0/

Science Direct http://www.sciencedirect.com/science/book/9780126726909

Scopus http://www.scopus.com/home.url

Journal of Dairy Research http://journals.cambridge.org/action/displayJournal?jid=dar

Journal of Dairy Science http://www.journalofdairyscience.org/

International Dairy Journal http://www.journals.elsevier.com/international-dairy-journal/

Dairy Science and Technology (Le Lait) http://www.dairy-journal.org/

ILE, Industrias Lácteas Españolas http://dialnet.unirioja.es/servlet/revista?codigo=2831

Milchwissenschaft http://www.milk-science-international.com/

Meat and meat products

BELLO, J. 2008. Jamón curado. Aspectos científicos y tecnológicos. Perspectivas desde la Unión Europea.Díaz de Santos, Madrid.

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KERRY, J. P. I D. A. LEDWAR, D. 2009. Improving the sensory and nutritional quality of fresh meat:new

technologies. Woodhead Publishing, Cambridge, Regne Unit.

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TOLDRÁ, F. 2010. Handbook of meat processing. Wiley-Blackwell, Oxford, Regne Unit.

WARRIS, P.D. 2010. Meat science: an introductory text. Wallingford. 2nd ed.

Electronic resources (acces from a PC conected to a UAB IP or throuot xpv):

http://www.knovel.com/web/portal/main (apartado Food Science)

http://www.sciencedirect.com

Encyclopedia of meat science

Encyclopedia of food and nutrition

Scientific and technic journals:

Fleischwirtschaft International

Journal of Muscle Foods

Meat Science

Poultry Science

WEBS:

American Meat Institute (AMI): http://www.meatami.com.

International Meat Secretariat (IMS): http://www.meat-ims.org.

World's Poultry Science Association (WPSA): http://www.wpsa.com.

Asociación Española de Empresas de la Carne (ASOCARNE): http://www.asocarne.com.

Asociación de Industrias de la Carne de España (AICE): http://www.aice.es.

Fish and derived products

ALASALVAR C. I TAYLOR T. (2002) Seafoods - Quality, technology and nutraceutical applications. Ed.Springer

BREMNER H.A. (2002) Safety and quality issues in fish processing. CRC Press .

DORE I. (1992) Seafood scams and frauds and how to protect yourself!Urner Barry Publications

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LUTEN J.B. [et al.] (2003) Quality of fish from catch to consumer: labelling, monitoring and traceability.Wageningen Academic Publisher

MARTIN R.E., CARTER E.P., FLICK GJ, JR., DAVIS L.M. (2000) Marine & freshwater Products Handbook.Technomic pub.

PARK J.W (2005) Surimi and surimi seafood Marcel and Dekker, 2nd edition

PEARSON A.M. I T.R. DUTSON (1995) Quality attributes and their measurement in meat, poultry and fish products. Kluwer Academic Publishers,

SHAMIDI F., JONES Y. I KITTS, D.D. (1997) Seafood safety processing, and biotechnology. Ed. Technomic Pub. Lancaster, USA.

Electronic resources (on-line)

El Pescado Fresco: Su Calidad y Cambios de su Calidad - 1999 FAO

Safety and Quality Issues in Fish Processing (en www.knovel.com)

Seafood Quality and Safety - Advances in the New Millennium (https://app.knovel.com/web/toc.v/cid:kpSQSANM03/viewerType:toc/root_slug:seafood-quality-and-safety---adva

WEBS

http://www.fao.org/

http://www.seafood.nmfs.noaa.gov/Program_Services.html

http://www.qim-eurofish.com/

http://www.seafoodsource.com/

http://www.eurofishmagazine.com/

http://www.ift.org/

http://www.intrafish.com/

http://www.conxemar.com/v_portal/apartados/apartado.asp

Eggs and derived products:

CASTELLÓ LLOBET, J. A. (2010) Producción de huevos Arenys de Mar, Real Escuela de Avicultura.

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THAPON J-L IBOURGEOIS C-M (1995) L'Oeuf et les ovoproduits Tech & Doc, Paris WELLS R.G. I

C.G. BELYAVIN (Eds.) (1987) Egg quality- Current problems and recent advances. Ed.

Butterworth & Co. Kent, UK.

YAMAMOTO T. (1997) Hen eggs: their basic and applied science Boca Raton CRC.

Electronic resources

Egg marketing: a guide for the production and sale of eggs FAO 2003

Risk assessments of salmonella in eggs and broiler chickens FAO 2002

Biochemistry of Foods (Third Edition) en http://www.sciencedirect.com/science/book/9780122423529

WEBS

http://www.aeb.org/

http://www.institutohuevo.com

http://www.wpsa-aeca.es/

https://www.internationalegg.com

http://www.sanovogroup.com/