Universitat Autònoma de Barcelona

2020/2021

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

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

Name: Victoria Ferragut Pérez

Email: Victoria.Ferragut@uab.cat

Use of Languages

Principal working language: spanish (spa)

Teachers

Marta Capellas Puig

Montserrat Mor-Mur Francesch

Reyes Pla Soler

Antonio José Trujillo Mesa

Manuel Castillo Zambudio

Bibiana Juan Godoy

Prerequisites

No official requirements are defined for this course. However, we strongly recommend that the student has basic knoledgement in general process at the food industry, and Food chemistry and 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.

Competences

- 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

Due to the exceptional circumstances of declared health crisis, the academic year 2020-2021 will be held in a semi-face-to-face mode. The beginning of the course will take place with virtual sessions of theoretical content (the planning will be published and detailed in the module's Moodle) and, from January 2021, the practical classes will be taught in person.

The contents and modalities provided are described below:

1. Milk and dairy products

- Milk: Influence of previous treatments on the quality of milk and derivatives. Influence of heat treatments on the quality of milk and derivatives.

- Yogurt and fermented milks: Initial quality of milk for the preparation of yogurt and fermented milks. Influence of the process on the quality of the final product. Use of microbial cultures for quality improvement. Defects in yogurts and fermented milks.

- Cheese: Initial quality of milk for cheese making. Cheese production procedures and their influence on the quality of the final product. Cheese defects.

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

2. Meat and meat products

- Quality of fresh meat: strategies in slaughterhouses and cutting rooms. Sanitary, organoleptic quality and shelf life.

- Injected meats: differentiation between legislation, organoleptic and nutritional quality. Ingredients and additives according to their function. Industrial performance.

- Restructured meats: applicable technologies, ingredients and necessary additives. Design potential of meats of desired composition.

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

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

3. Fish and derived products.

- Optimization of the processing offishery products: based on the quality factors already known for each type of product and pursuing benefits for the environment, for the industry and for the consumer.

- Assessment of the quality of fish and processed products: delve into the most recent contributions of instrumental and sensory analytical methods.

4. Eggs and egg products.

- Quality assessment: current methodologies applicable to shell eggs, non-destructive and to the most widely used isolated components and their derivatives in the industry.

Methodology

The methodology of the module will be based on the delivery of master classes, lectures by professionals in the corresponding sector, seminars and exhibition of work by students through self-study work. All this content will be virtual through the Teams platform, synchronously, or through different virtual supports through the module's Moodle; Laboratory practices, as well as scheduled visits to industries, will be carried out in person, at the end of the module.

Milk and dairy products:

- General introduction and quality control in milk, yogurt and fermented milks, and cheese: virtual.

- Quality control in the dairy industry producing pasteurized / sterilized milk: visit to a laboratory.

- Influence of the factors of the yogurt production process on the quality and quality control of the final product: laboratory practice.

- Influence of the coagulation of milk and curd whey on cheese quality: virtual practice.

- Cheese quality control: laboratory practice.

- Ice cream quality in the industry: virtual conference given by a professional in the sector.

- Self-learning: students, in small groups (2-3 people depending on enrolled), will study the main effects that determine the quality of different dairy products by performing an oral: virtual exhibition

Meat and meat products

- Theoretical content: virtual

- Self-learning: students, in small groups or individually will study one of the topics proposed in more depth: virtual

- Use of additives in meat products and their influence on the final quality: laboratory practice

Fish and derived products

- Theoretical content: virtual

- Quality control in the fishing industry: virtual conference of a professional of the sector.

- Quality and fishing industry: visit to the food market and an industry in the sector

Eggs and egg products

- Theoretical content: virtual.

- Methods of evaluation of the quality of the raw material: laboratory practice

- The quality in the production of egg products: virtual conference of the professional of the sector.

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

Assessment

The competences of this module will be evaluated by subjects:

- Milk and dairy products: 40% attendance at theoretical (virtual) and practical classes and 60% self-study work.

- Meat and meat products: a) 40% attendance at theoretical (virtual) and practical classes; b) 40% self-study work; c) 20% questions about self-study work. The note of b) will be from the notes put by the teacher and the classmates.

- Fish and fish products: making a presentation on a research article, in English. In pairs. The note of will be from the notes put by the teacher and the classmates.

- Eggs and egg products: presentation of a research article, in English. In pairs. The note of will be from the notes put by the teacher and the classmates.

The final grade will be the weighted average taking into account the number of the load of the different subjects in the module.

Assessment 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.

GRIFFITHS, M. W. (2010). Improving the Safety and Quality of Milk, Volume 1 - Milk Production and Processing, Volume 2 - Improving quality of milk products. Woodhead Publishing, Cambridge, UK.

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

HUI, Y.H. (1993). Dairy Science and Technology Handbook, Volumes 1-3. John Wiley & Sons, New York, USA.

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.

SMIT, G. (2003). Dairy Processing - Improving Quality. Woodhead Publishing, Cambridge, UK.

STOGO, M. (1998). Ice cream and frozen desserts: a commercial guide to production and marketing. JohnWiley & Sons, Nueva York, USA.

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.

BRAUER, H. 2009. Technology for boiled sausage production. Allgemeine Fleischer Zeitung, Frankfurt am Main, Alemanya.

BRAUER, H. 2009. Technology for cooked ham production. Allgemeine Fleischer Zeitung, Frankfurt am Main, Alemanya.

GUERRERO-LEGARRETA, I., A. D. ALARCÓN-ROJO, G. CHERIAN I F. GUERRERO-AVENDAÑO. 2010. Handbook of poultry science and technology. Vols. I i II. Wiley-Blackwell, Oxford, Regne Unit.

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.

LAWRIE, R. A. I D.A. LEDWAR, D. 2006. Lawrie's Meat science, 7a ed. Woodhead Publishing, Cambridge.

TARTÉ, R. 2009. Ingredients in meat products: properties, functionality and applications. Springer Science + Business Media, Nova York, Nova York, EUA.

TOLDRÁ, F. (Ed.). 2008. Meat biotechnology. Springer, New York.

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

HALL G.M. (2001) Tecnología del procesado del pescado. Ed. Acribia, SA

LOVE R.M. (1988) The food fishes: their intrinsic variation and practical implications. Ed. Avi Book

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.

MEAD G. C. (ed.) (2009) Análisis microbiológico de carne roja, aves y huevos. Ed. Acribia Zaragoza.

NAU F. (2010) Science et technologie de l'oeuf. Tec & Doc / Lavoisier, París.

SIM J.S. I S. NAKAI (1994) Egg uses and processing technologies. New developments. CAB Int. Oxon.

STADELMAN W.J. I O.J. COTTERILL (1990) Egg science and technology. 4th ed. Ed. Avi Pub. Co. Inc.,Wesport, USA.

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/