UAB
Universitat Autònoma de Barcelona

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Quality Control and management Tools for the Agricultural Food Industry

Code: 43034
ECTS Credits: 12

Degree	Type	Year	Semester
4313796 Quality of Food of Animal Origin	OB	0	2

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Use of Languages

Principal working language: spanish (spa)

External teachers

Mercè Sanchez Rodríguez

Prerequisites

The requirements to take this module are the generic regulations for this Master. In addition, we will need to have pass the previous modules.

Objectives and Contextualisation

The objective of the module is to provide students with the necessary tools to evaluate and manage the quality of food.Based on this, the contents of this module will develop three aspects

- The principles of experimental design and data analysis, in order to obtain representative results and correct conclusions about the quality parameters as well as the principles of communication, oral and written of the results.

- The application of methods of analysis for determining the quality indicators, physical, chemical, instrumental, sensory and microbiological, paying particular attention to the most innovative methods of analysis that allow quick results.

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- The utility systems of quality management internationally accepted (ISO, IFS, BRC, etc.), as the tools to ensure both the overall quality and food safety, the effective operation of processes and facilities involved throughout the food chain.

Competences

- Apply analytic methodologies to evaluate food and raw material quality indicators.
- Apply research methodology, techniques and specific resources to carry out research and produce innovative results in a specific area of specialisation.
- Design an experimental procedure from the sampling stage through to the evaluation of findings.
- 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.
- Implement quality management systems for the agri-food industry.
- Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.

Learning Outcomes

1. Apply the methodologies of analysis and management that are best suited to the innovation needs of a product or process.
2. Apply the most appropriate statistical methods for each type of analysis.
3. Assess the fulfillment of the requisites established for each point in the system.
4. Assess the results obtained and draw conclusions from these.
5. Carry out an internal audit.
6. Choose the most appropriate quality standard for each purpose.
7. Correctly prepare and preserve samples in accordance with the type of analysis to be made.
8. Describe the basic principles of the systems used to evaluate quality in real-time, their potential uses and their limitations
9. Design a sampling programme, with selection of lots and a number of samples that is appropriate for each purpose.
10. Draw up a plan and a calendar for implementing the system.
11. Fill out the documents and records required in each system.
12. Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
13. Organise laboratory work in such a way as to make the best possible use of the time and space available.
14. Prepare a report on results that is well-designed and structured, and appropriate for each type of analysis.
15. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
16. Use appropriate laboratory equipment and run checks to make sure it is working properly.
17. Use the appropriate analytic procedure for each parameter and establish its limitations.

Content

The contents of this module are distributed in the following thematic blocks:

Methods of experimental design, data analysis and results presentation:

This block will work on the principles of experimental design and data analysis, in order to obtain representative results and correct conclusions about the quality parameters evaluated, as well as the principles of oral and written communication, of the results. This aspect is done through two different subjects:

- Statistical analysis: the main procedures of statistical data analysis will be explained using the "R" program.
- Scientific communication: procedures for the results presentation (technical reports and scientific papers).

Quality indicator methods:

In this block, we will work with the main analytical procedures for assessing food quality indicators, paying special attention to the most innovative methods, designed to obtain fast and reliable results. The contents will be taught in theoretical and practical sessions, in addition to the individual work based on practical cases. The unit contents will be included in the following thematic blocks:

- Instrumental Analysis: Sampling. Chromatographic techniques, capillary electrophoresis, NIR, DSC, etc. Applications to the Food Chain and validation of techniques.

- Methods for evaluating the characteristics of colloidal foods: application of assessment methodologies of the functional properties of food, rheology and texture.

- Sensory analysis: basic and emerging methodologies.

- Fast and automated methods for the microbiological examination of food and hygienic evaluation of the food processes in the industry. Application of immunological methods to detect food hazards.

- Application of molecular genetic techniques in the food chain: amplification systems and DNA sequencing. Bioinformatic procedures of the data analysis. Applications in detecting GMOs, allergens and food biological contaminants. Authentication procedures and traceability.

The quality management statments:

This block will describe the usefulness of internationally accepted quality management systems (ISO, IFS, BRC, etc.), as well as the tools to guarantee global quality and food safety, as well as the proper functioning of processes. and facilities involved throughout the food chain. This aspect is dealt with in the area of quality management.

Methodology

The module will be developed in 90 hours of theoretical sessions (lectures, seminars) and practices (laboratory and computer classroom).Different self-learning activities (ndividual or collective) will also be proposed, which will include resolution of practical cases, with a workload for the student of approximately 210h.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Theoretical and practical sessions	90	3.6	2, 1, 8, 9, 14, 10, 11, 13, 7, 12, 15, 6, 17, 16, 3, 4
Type: Autonomous			
Accomplishment of work and resolution of practical, individual	210	8.4	2, 1, 8, 9, 14, 10, 11, 5, 13, 7, 12,

Assessment

At the beginning of each block, the responsible professor will inform about the activities to be carried out and the relative weight of the activities and assistance in the note.The final mark of the module will be obtained after weighting the partial notes of each block according to their relative weight in the module.To pass the module you also need a minimum average grade of 5 out of 10.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Attendance at theoretical and practical sessions	Variable according to block	0	0	2, 1, 8, 9, 11, 13, 7, 12, 15, 6, 17, 16
Resolution of practical cases and self-learning activities	Variable according to block	0	0	2, 1, 8, 9, 14, 10, 11, 5, 12, 15, 6, 3, 4

Bibliography

Books:

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Kilcast, David. 2004. "Texture in Food, Volume 2 - Solid Foods". Woodhead Publishing

Kress-Rogers, E., Brimelow, C. J. B. (Ed.). 2001. "Instrumentation and sensors for the food industry". Ed. Woodhead Publishing Limited, Cambridge, UK.

Malmfors, Birgita; Garnsworthy, Phil; Grossman, Michael, 2004, 2nd ed. "Writting and presenting scientific papers", Nottingham University Press, Nottingham, UK.

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Olsen, E. D. 2008. "Métodos ópticos de anàlisis". Ed. Reverté, S. A., Barcelona.

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Sun, D. W. (Ed.). 2009. Infrared spectrosocpy for food quality analysis and control. Academic Press.

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