Quality Control and management Tools for the Agricultural Food Industry   2014/2015

Code: 43034
ECTS Credits: 12

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

Contact

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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

Elena Albanell Trullas

Victoria Ferragut Pérez

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Montserrat Mor-Mur Francesch

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Artur Xavier Roig Sagués

Armand Sánchez Bonastre

Joaquín Casellas Vidal

Prerequisites

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

Objectives and Contextualisation

The module aims to provide students with the necessary tools to assess 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, 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.

Skills

- 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 divided into the following sections:

1. Methods of experimental design, data analysis and presentation of results:

This section will work on the main sampling procedures for obtaining meaningful data. The main procedures of statistical analysis of data will be explained using the "R" program and using practical examples. Statistical

concepts will be applied to control of food quality and processes (accuracy, precision, repeatability). Procedures for the Presentation of results, oral and written (technical reports and scientific papers) will be explained.

1. <u>Methods of analysis of quality indicators:</u>

This section will work on the main analytical procedures for assessing quality indicators in food, devoting special attention to the most innovative methods, designed for fast and reliable outcome. The contents are taught in theory and practical sessions and individual work based on practical cases. The unit content will be included in the following sections:

- 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, measure of particle rheology and texture. Evaluation by microscopy.

- Procedures of sensory analysis: basic and emerging methodologies.

- Fast and automated methods for the microbiological examination of food and hygiene evaluation of the processes in the food industry. Application of immunological methods for detecting threats in food.

- 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.

- Application of image analysis techniques in the assessment of food quality.

1. <u>The standards of quality management:</u> in this section the main standardized quality management procedures, applicable to the food industry will be described (ISO, IFS, BRC, etc..). The student will also be introduced to the procedures for certification and accreditation of both food establishments and laboratories that provide services to the food industry, including audits, major existing applications for quality management.

Evaluation

The evaluation of this module will be based on the following:

- Attendance to the theoretical and practical sessions scheduled.
- Resolution of practical cases and self-learning activities.

The evaluation criteria can differ from block to block. At the start of each block (or sub-blocks in the case of the block of analysis methods), the professor will report what activities are to be performed and the relative importance of the activities and assistance on the grade. The final mark of the module will be obtained after weighing the ratings of each partial block by weight relative to the module. However, an imperative prerequisite will be having approved each one of the blocks with a minimum of 5 out of 10 to pass the module. To pass the module also need a minimum average rating of 5 out of 10.

Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
		0	0	2, 1, 8, 9, 14, 10, 11, 5, 13, 7, 12, 15, 6, 17, 16, 3, 4
		0	0	2, 1, 8, 9, 14, 10, 11, 5, 13, 7, 12, 15, 6, 17, 16, 3, 4