

30816 - Physical and sensory analyses of food

Información del Plan Docente

Academic Year	2016/17
Academic center	105 - Facultad de Veterinaria
Degree	568 - Degree in Food Science and Technology
ECTS	6.0
Course	2
Period	Second semester
Subject Type	Compulsory
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The learning process designed for this course is based in...

The course is organized in 30 participatory lectures, 6 hours of seminars and 24 hours of laboratory practices.

The seminars will be organized in 2 hours sessions. During them some practical exercises and problems of the different

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subjects will be done. In some cases English written tables and figures will be used. In this way at the same time the students will solve the problems and they will have also a glossary of English technical words related with the course with their corresponding translation in Spanish.

The laboratory practices will be 4 hours sessions. 3 sessions will be dedicated to physical analysis and other 3 sessions will be dedicated to sensory analysis. The practice number 2 will be coordinated with Food Chemistry and Biochemistry course.

The student will need also to make a work about the physical and sensory analysis necessary to do from a legal, technological, and commercial point of view to evaluate and control the raw material and final product quality. This practical work will be coordinated with Food Chemical Analysis and Food Microbiological Analysis courses. The assignation of the raw material to the students will be when the academic year will start. The students will make the project in 3-4 people workgroups. Finally the project will be delivered to the teachers responsible of the three courses for evaluation.

5.2.Learning activities

The program offered to the student to help him to get the expected results includes the following activities:

1. Lectures. 30 presential hours (1 hour sessions).
2. Laboratory practices. 24 presential hours (4 hours sessions).
3. Seminars: 6 presential hours (2 hours sessions).
4. Elaboration and presentation of the Integration Project. 20 not presential hours.

5.3.Program

Block 1- Food Physical analysis

Lectures

1- FOOD Morphogeometrical properties (1 hour)

- Importance of morphogeometrical properties in food processing operations and process control.
- Farm products and particulate products shape and size. Experimental determination.
- Volume and density. Porosity. Surface area. Experimental determination.
- Density measurements application in food quality control.

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2- Food thermal properties (2 hours)

- Importance of thermal properties in food processing.
- Properties related with energetic content: sensible heat and latent heat. Enthalpy.
- Properties related with heat transport: conductivity and diffusivity.
- Differential scanning calorimetry: applications in thermal properties measurement and quality control.

3. Food optical properties. Colorimetry (5 hours)

- Colorimetric definitions.
 - The eye. Model of color vision.
 - Grassman Laws.
 - Perceived colors.
 - Color attributes.
 - Patterns illuminants.
 - Pattern observer. CIE Matching functions.
 - Calculation of tristimulus values (CIE Method).
 - CIEYxy space.
 - CIELAB space.
 - Color practical determination. Lighting geometries detection.
 - Brightness and its measurement.
 - Colorimetry with photo cameras and scanners.
- ### 4. Food rheological properties (4 hours)
- Importance of rheological properties in food processing operations and process control. - Rheological classification of fluids. Definition of solids, fluids and viscoelastic materials. Newtonian and non- Newtonians fluids. - Rheological behavior, interest magnitudes and effect of different factors. Rheological models. -Instruments for rheological behavior measurement. Viscometers and rheometers. Measurement geometries. - Practical applications. Choice of tests and measurement parameters. Results interpretation.

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5. Food textural properties (4 hours)

- Importance of textural properties in food processing operations and process control.
- Texture concept. Elastic and viscoelastic products.
- Texture evaluation method. Sensory and instrumental measurements. Instruments and tests. Texture measurement method choice.

6. Food Surface properties (3 hours)

- Importance of Surface properties in food processing operations and process control.
- Surface tension. Contact angle and surface tension measurement.
- Food colloidal systems: sols, gels, emulsions and foams.

7. Water activity and food sorption properties (1 hour)

- Importance of water activity in food preservation.
- The water in foods. Water activity.
- Water activity measurement methods.

In each section firstly the definition of the different properties will be explained and the importance in foods. Then some values of these parameters in foods will be showed. The influence of processing, the more relevant equipments and technics for measurement and also the interpretation of the obtained results will be described.

Laboratory practices

Practice 1- Food color experimental measurement: Spectroradiometer. Spectrophotometer.

Practice 2- Gels elaboration and textural and rheological properties measurement.

Practice 3- Obtaining foams and emulsions. Stability measurement. Bostwick Consistometer. Thermal analysis.

Block 2- Food SENSORY analysis

Lectures

8. Introduction (1 hour)

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- Concept and utility of sensory analysis.
- Relation with physiology and psychology.
- The role of senses.
- Thresholds and sensitivity. **9. Terms for sensory analysis realization (1 hour)** - Samples preparation and coding. - The testing room: environmental requirements. Tasting booths. - Utensils and materials for sensory analysis. **10. Sensory analysis techniques (3 hours)** - Types of tests. - Discriminatory tests: the paired comparison. The triangle test. Used scales. Ordination tests. Classification tests. - Descriptive test. Specific profiles. - Acceptance tests. **11. Judges and panels test (2 hours)** - Panels types
- Judges preselection and selection.
- General and specific training for judges.

12. Experimental and statistical design in sensory analysis (1 hour)

- Tests design.
- Data statistical analysis.
- Reports preparation.

13. Consumer sensory analysis (2 hours)

- Techniques
- Preference tests and degree of satisfaction measurement
- Consumer attitudes

Laboratory practices

Práctica 4 - Judges selection and training. Detection of the main tastes, flavors and odours. Detection thresholds.

Práctica 5- Discrimination tests. Preference or acceptance tests. Descriptive tests.

Práctica 6- Specific profiles in different foods: sensory analysis of dairy products, sensory analysis of meat products.

Before starts the block I during the first session an explanation of the content of the course will be done. Also the systematic about the lectures and laboratory practices, evaluation, bibliography, etc and an introduction about relation between food physical properties and sensory analysis will be explained.

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ACTIVITY	PRESENTIALS HOURS	FACTOR	NON PRESENTIALS	TOTAL
Lectures	30	1,5	45	75
Seminars problems	6	1	6	12
Prácticas	24	0,5	12	36
Practical work			20	20
Exam			7	7
Total	60		90	150

5.4.Planning and scheduling

The calendar of the matter is described with the other matters for second course of CTA Degree in the web of Veterinary Faculty in the next address <http://veterinaria.unizar.es/gradocta/>). This address will be updated each academic year.

5.5.Bibliography and recommended resources

BB

Carpenter, Roland P. : Análisis sensorial en el desarrollo y control de la calidad de alimentos / Roland P. Carpenter, David H. Lyon, Terry A. Hasdell ; traducción de Manuel Alcalá Aguilera . - 1ª reimp. Zaragoza : Acribia, 2009

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Lewis, M.J.. Propiedades físicas de los alimentos y de los sistemas de procesado / M.J. Lewis ; traducido por Julián Zapico Torneros, Juan Pablo Barrio Lera . Zaragoza : Acribia, D.L.1993

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- BB** Propiedades físicas de los alimentos /Chiralt Boix, Amparo [et al.]. Valencia : Universidad Politécnica de Valencia, 2007
- BB** Sahin, Serpil. Propiedades físicas de los alimentos / Serpil Sahin y Servet Gülüm Sumnu ; traducción a cargo de Albert Ibarz Ribas . Zaragoza : Acribia, imp. 2009
- BC** Análisis de los alimentos : manual de laboratorio / editora S. Suzanne Nielsen ; traducción de Ana Cristina Ferrando Navarro ; revisión de Miguel Ángel Usón Finkenzeller . Zaragoza : Acribia , D. L. 2007
- BC** Análisis de los alimentos / editora S. Suzanne Nielsen ; traducción de Ana Cristina Ferrando Navarro ; revisión de Miguel Ángel Usón Finkenzeller . [ed. en español, traducción de la 3ª ed. en inglés] Zaragoza : Acribia, 2009
- BC** Lees, R.. Análisis de los alimentos : Métodos analíticos y de control de calidad / R. Lees . 2ª ed española / traducida de la 3ª ed. inglesa por José Fernández Salguero Zaragoza : Acribia, D. L. 1982